ANNALES HISTORICO-NATURALES MUSEI NATIONALIS HUNGARICI
Tomus 86. Budapest, 1994 p. 53–77

Polyommatine lycaenids of the oreal biome in the Neotropics, part II: The Itylos section (Lepidoptera: Lycaenidae, Polyommatinae)

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BÁLINT, ZS. & JOHNSON, K. (1994): Polyommatine lycaenids of the oreal biome in the Neotropics, part II: The Itylos section (Lepidoptera: Lycaenidae, Polyommatinae). – *Annls hist.-nat. Mus. natn. hung.* 86: 53–77.

Abstract – The genus *Itylos* DRAUDT (sensu HEMMING 1929, 1967) is revised to include species *I. titicaca* (WEYMER) (= *Cupido speciosa* STAUDINGER, syn n.), *I. pnin* BÁLINT and *I. fumosus* (BALLETTO) (= *I. luzhin* BÁLINT, syn. n.). The group comprises a small monophyletic unit distributed in the oreal biome of the high Andes from central Peru (Ancash) to northern Chile (Tarapacá). Two poorly known populations of the *titicaca*-complex are noted as possibly of at least subspecific value worth pending further biological research. A recently described monotypic appendage of the group, *Ityloides* BALLETTO is synonymized with *Itylos* based on phylogenetic criteria. The *titicaca*-complex is suggested as the apotype of the genus and the evolution of its ityloid wing pattern discussed. *Itylos*, as revised, is indicated as of uncertain sister relationship and not directly monophyletic with the "*Polyommatus* section" of ELIOT. A new "*Itylos* section" of the tribe Polyommatini is therefore suggested. Workers are encouraged to initiate field and biological research to further clarify relationships. With 70 figures.

INTRODUCTION

The xeromontane phenomenon was firstly recognized in the Palaearctic Lepidoptera fauna by VARGA (1976), who applied the terminology of VOOUS (1963). According to VARGA's investigations (VARGA 1989) the not arboreal faunal types in the Palaearctic Realm comprised three basic elements. Two of them are zonal: 1) the eremial biome caused by aridity; 2) the alpine-tundral biome created by low temperatures. The third, the xeromontane element (*sensu stricto*), is orographic depending on special enviromental factors (edaphic, microclimatic, anthropogenic, etc.) and provides the possibility for various biotic communities to interdigitate or coexist.

These phenomena have also been recognized in the temperate regions of South America despite the fact that, in reality, they are only superficially similar and comparable (DORST & VUILLEUMIER 1986). For instance, the tundral biome has been compared with the Patagonian cold steppe biome in the austral regions of South America and the so-called alpine belt of the north is often recognized in South America as the high páramo (see, for instance, BROWN 1942). Similarly, the eremial biome has been noted in South America as occurring along the western Pacific Coast (especially in the Chilean Atacama and Pacific desert regions). Perhaps the best known xeromontane phenomena (*per se*) noted in South America are the puna and other high Andean areas. In all, these comprise diverse communities including many types of plant formations, but all are specialized not arboreal communities which exist under rather specialized, dry temperate climatic conditions (SARMIENTO 1986).

The cosmopolitan *Polyommatus* section sensu ELIOT (1973: 449-450), in spite of its polyphyletic appearance (see BÁLINT & JOHNSON 1994 and Discussion below), appears to be strongly connected to dry plant formations over the entire world. All taxa of the *Polyommatus* section genera listed by ELIOT are highly stenochorous butterflies associated with specialized microhabitats within localized vegetations (in the case of Neotropical *Pseudolucia*, see BÁLINT & JOHNSON 1993a). Only some widely distributed generalists are known, e.g. *Polyommatus icarus* (ROTTEMBURG, 1775) or *Aricia agestis* (DENIS et SCHIFFERMÜLLER, [1775] in the western Palearctic region, which may have resulted from the ancient and strong human influence in the region (BÁLINT 1992).

ELIOT listed nine South American "polyommatine" genera which seem to be strongly related with the oreal biome in their distributional patterns (see BÁLINT 1993a). The present work deals with perhaps the smallest component, namely taxa of the genus *Itylos* DRAUDT, [1921] (sensu BÁLINT 1993a, b).

Until very recently, only a single species was recognized in *Itylos* (DESCIMON 1986: 519; BRIDGES 1988: II.81) and a confused taxonomy and nomenclature associated with this rather remarkable and easily recognized entity (BÁLINT 1993a: 6). BÁLINT (1993a: 13-14), however, described some new species in the genus, and recorded as well a number of outlying populations whose status required further taxonomic resolution. In addition, BALLETTO (1993) described one component of this monophyletic group as a monotypic genus, an action requiring evaluation here in a broader context. Hence, in the present study, we first identify *Itylos* and its relatives and then discuss the taxonomy, relationships and monophyly of the group. Finally, we evaluate whether this *Itylos* section is monophyletic with taxa of ELIOT's *Polyommatus* section.

MATERIALS AND METHODS

Material examined included specimens from the following institutions: American Museum of Natural History (New York, USA) (AMNH), Hungarian Natural History Musuem (Budapest, Hungary) (HNHM), Instituto Miguel Lillo (Tucumán, Argentina) (IML), Natural History Museum (London, UK) (BMNH), Naturhistorisches Museum (Vienna, Austria) (NMW), Zoologisches Museum der Humboldt Universität zu Berlin (Berlin, Germany) (ZMHU). In addition, specimens from private collection of Señor LUIS PEÑA (Santiago, Chile), the late JOSE HERRERA G. (Santiago, Chile) and Dr. HENRY DESCIMON (Marseille, France) were consulted. Dissected material is deposited as reported in the individual taxonomic entries.

Terminology follows the initial part of this series (BÁLINT & JOHNSON 1994); nomenclatural sources are HEMMING (1967), BRIDGES (1988) and BÁLINT (1993a).

Abbreviations for institutions are as noted above, further abbreviations used in the descriptive texts are as listed in BÁLINT & JOHNSON (1994).

To characterizing entities we follow the methods of NABOKOV (1945) (the first reviser of the Neotropical polyommatines), who underlined the taxonomic importance of the genitalic armatures in lycaenid systematics. This method was later confirmed by larger comprehensive studies on the Lycaenidae by such authors as STEMPFFER (1967), ELIOT (1973) and HIROWATARI (1992). Our results are thus based mostly on structural principles including genitalic and morphologic characteristics. As principal investigations were carried out at Budapest (in the Institute of the first author), some limits were imposed on taxonomic methods. For instance, although we are convinced that overall results would be the same, aid of a scanning electron microscope (SEM) might have presented some important additional interpretative data (see e.g. ROBBINS 1991).

Consistent with our previous treatment of *Nabokovia* and *Polytheclus* (BÁLINT & JOHNSON 1993b, 1994), since studied genera and species are few in number, we rely on standard diagnostic format and do not present cumbersome dichotomized keys. Criteria for taxa are rather typological and empirical in the fashion of NABOKOV (1945: 3-6) and traditional alpha taxonomy. Considering the present state of knowledge concerning Neotropical polyommatines, it is difficult to employ biological criteria. The distributions of the taxa are poorly known and virtually nothing has been published concerning habitat or host preferences, life histories, or the presumed myrmecophyly of these insects (cf. BÁLINT 1993a: 3). Comparative data referred to in Discussion is based mainly on the rather well-illustrated publications of ELIOT (1973), HIGGINS (1975), HIROWATARI (1992) and STEMPFFER (1967).

SYSTEMATICS

Itylos DRAUDT, [1921]
Itylos DRAUDT, [1921]: 821.
Itylos: HEMMING 1929: 240.
Parachilades NABOKOV, 1945: 6., **syn. n.**
Itylos: HEMMING 1967: 236.
Ityloides BALLETTO, 1993: 232., **syn. n.**
Itylos BÁLINT, 113a: 6.
Type Species – *Cupido speciosa* STAUDINGER, 1894 by designation of HEMMING (1929

Short taxonomic history – **Itylos sensu DRAUDT, [1921]:** The genus was first used by DRAUDT ([1921]: 818) in the heading for "*Lycaena (Rusticus) ruberrothei* WEEKS". Three pages later DRAUDT mentioned it as "15. Gattung: *Itylos* gen. n.". DRAUDT distinguished two species groups in his genus: first, a group of species consisting of taxa included *Madeleinea* and *Paralycaeides* by BÁLINT (1993a); second, the two formerly mentioned of *Itylos s. str.* (see also BÁLINT 1993a: 3). However, the genus, as described, had no type species; this was designated later by HEMMMING in 1929 (see NABOKOV 1945: 38), who chose *Cupido speciosa* as the type species.

Itylos sensu NABOKOV (1945): NABOKOV (1945: 38) did not recognize the type species designation of HEMMING because of the circumstances noted above, e.g. DRAUDT had first associated *Itylos* with the taxa *ruberrothei* WEEKS, 1902, *moza* STAUDINGER, 1894 and *inconspicua* DRAUDT, [1921], structurally an entirely different group of taxa than the *titicaca-speciosa* taxa pair. So, to NABOKOV, *Itylos* is identified with the *koa*-group s.l. (= *Madeleinea* BÁLINT, 1993). Accordingly, NABOKOV designated the type species of his *Itylos* as *Cupido moza* STAUDINGER (1894) and, some pages before, erected a new genus *Parachilades* for the second group of DRAUDT (NABOKOV 1945: 6), for which he presented a formal generic diagnosis. In spite of the fact that NABOKOV's view is logical, his action is invalid because the original *Itylos* type species designation of HEMMING was perfectly valid (cf. HEMMING 1967: 236-237). As a result, *Parachilades* NABOKOV, 1945 is a synonym of *Itylos* DRAUDT, 1921, herein used as a **syn n.**.

In the most recent literature (e.g. URETA 1964, ELIOT 1973: 450, BRIDGES 1988: II.81, JOHNSON 1992a) NABOKOV has generally been followed, using *Parachilades* or, in one case (FORSTER 1955: 87 and Taf. 30, Fig. 1) "*Ithylos*" for butterflies like *speciosa*. This nomenclatoric confusion was only recently clarified by BÁLINT (1993a: 6, 13-14) in which *Itylos* was restricted to the usages documented in the present paper. However, in a paper appearing a month earlier BALLETTO (1993) described one component of the *Itylos* assemblage as a monotypic genus, an action we evaluate at more length below.

Synopsis of Species –
Itylos titicaca (WEYMER, 1890)
(= *Cupido speciosa* STAUDINGER, 1894, **syn. n.**, and here tentatively including also some outlying populations still needing further status evaluation [see below deme of "Ancash" and "Tucumán"]).
Itylos pnin BÁLINT, 1993
Itylos fumosus (BALLETTO, 1993)(= *Itylos luzhin* BÁLINT, 1993, **syn. n.**).

Diagnosis of the Genus – Body: Eyes naked, palpi with strong black hairs, foreleg tibial spine absent, abdomen short. Wing venation (Fig. 64): FW with veins Sc and R1 briefly anastomosed. Wing shape: FW with convex, apex rounded, inner margin short and convex, tornus rounded, anal margin very short comparing with costa. Pattern: Sexes dissimilar on DW (only *titicaca* known). Male DW with purple blue ground bordered by narrow black margin. Female DW ground cold blue with relatively wide black margin. Fringes checkered, type 5. FW costa fringed at apex. VFW with bronze brown with suffused polyommatine resembling markings. VHW pattern ityloid (NABOKOV 1945, Fig. 1.). Androconial scales: absent. Male genitalia: Uncus pointed, straight and long; gnathos long, thick and pointed; tegumen and vinculum short with strong shaddle, appendix angularis absent; juxta saddled with short but well developed arms; valve wide with rounded costa, strong costal rostellum and large, well developed and pointed anal process; aedeagus thickish with relatively well devoloped alulae; sagum absent. Female genitalia: Papillae anales normal polyommatine shaped but broad and large; ostium bursa and anterior lamella strongly developed, 8th tergit large with elongate uniplanar apodeme.

More detailed diagnosis can be found in NABOKOV (1945: 6-10).

Distribution – In the oreal biome the high of Andes, from central Peru (Ancash) to northern Argentina (Tucumán). Further involved countries: Chile and Bolivia (Fig. 33).

Phylogenetic Affinities and Placement – The genus *Itylos* was placed (as *Parachilades* NABOKOV) in ELIOT's omnibus *Polyommatus* section (ELIOT 1973) with 32 other available generic names. ELIOT listed several diagnostic characters of his *Po-*

lyommatus section but also mentioned several times the oddity of the Neotropical representatives.

Based on the data of the present revision, summarized in Discussion below, we suggest removal of the genus from the *Polyommatus* section and placement in an independent section of the tribe Polyomamtini. We discuss this further in subsequent comment on ELIOT's diagnostic characters and the characters used recently by BALLETTO (1993) to propose one component of the group as a monobasic genus.

Etymology – "Itylos"; the oldest son of Aedon in the Greek mythology.

Itylos titicaca (WEYMER, 1890)

Lycaena titicaca WEYMER, 1890: 122.
Cup.[ido] Speciosa STAUDINGER, 1894: 77.
Parachilades titicaca: NABOKOV 1945: 6.
Itylos speciosa: DESCIMON 1986: 519.
Parachilades titicaca: DESCIMON 1986: 519.
Parachilades titicaca speciosa: BRIDGES 1988: I. 350, II. 81.
Itylos titicaca: BÁLINT 1993a: 13.

Figures – wings: Figs 1-20; male genitalia: Figs 34-42, 58-60; female genitalia: Figs 61-63; wing wenation: Fig. 64.

Diagnosis – Antennae below brownish grey. FW costal margin slightly convex. DW without markings. Male ground deep purple with relatively narrow black margin. Female ground blue with strong bronze shade and wider black margin. Fringes long, checkered (type 5). VFW ground brown with reduced polyommatine markings. VHW pattern complex and variable: with grey basal spot in discal cell bordered by black colour; basal, postbasal and submedian area brown; median area grey with suffused brown discoidal spot, postmedian area with brown band; marginal area ash grey with prominent longish black spot in cell CuA2. Male genitalia with very long and slender uncus, spined saccus, pointed juxta, valva with very strongly developed anal process, aedeagus thick with curved suprazonal portion subequal to subzonal one, alulae considerably developed. Female genitalia with broad and large polyommatine papillae anales; ostium bursa and anterior lamella strongly developed, 8th tergite large with elongate uniplanar apodeme.

FW length of males: 6,5-9 mm (n=10). FW of females: 6-8,5 mm (n=10).

Distribution – From central Peru (Ancash) throughout southern Peru and Bolivian Andes, to northern Chile (Tarapacá) and northern Argentina (Tucumán) (Fig. 33).

Biology – The species must have several generations according to the examined material but the exact flight period of the broods cannot be ascertained from the available material. The habitat of the species is the puna or high Andean páramo at considerably high elevations, 4000-5500 m (GARLEPP 1892: 273, FORSTER 1955: Table 30, Fig. 1) or even in still snowy páramo (FORSTER 1955 and SIMONS's label data). Colonies are strongly isolated but individual numbers appear to be very high. GARLEPP could collect 15 specimens in near Huallatani, Bolivia for STAUDINGER (1894: 77). Amongst material elaborated by us there is a long series collected by PEÑA on a single day. This highly disjunct occurrence with high individual density is also typical for the Palearctic lycaenids in Central Asia (G. RONKAY and Z. VARGA, pers. comm.).

The following polyommatine lycaenids were collected with *I. titicaca* (involved localities in brackets): *Nabokovia faga* (DOGNIN, 1895) (Peru: Ancash, Cuzco); *Eldoradina cyanea* (BALLETTO, 1993) (Peru: Ancash); *E. sylphis* (DRAUDT, [1921]) (Peru: Cuzco); *Paralycaeides inconspicua* (DRAUDT, [1921]) (Peru: Cuzco); *P. vapa* (STAUDINGER, 1894) (Peru: Cuzco; Bolivia: Huallatami, Marcapata, La Paz); *Madeleinea koa* (DRUCE, 1876) (Peru: Ancash, Challabamba, Cuzco, Puno; Bolivia: Illimani, Marcapata); *Madeleinea sp. n. p. lolita* BÁLINT and LAMAS in litt. (Peru: Ancash); *M. ludicra* (WEYMER, 1890) (Peru: Puno); *M. pacis* (DRAUDT, [1921]) (Peru: Challabamba, Cuzco Guaqui, Puno); *M. pelorias* (WEYMER, 1890) (Chile: Tarapacá). Larval foodplant and the nectar sources of the adults are unknown.

Remarks – **Synonyms:** NABOKOV (1945: 6-7) first suggested that *Cupido speciosa* STAUDINGER, 1894 was a synonym of *Lycaena titicaca* WEYMER, 1890 (see Fig. 13). Five males and one female *titicaca* specimens were investigated by him (see BÁLINT 1993a, Table 1). NABOKOV based his statement on the fact that the "Sicasica, Bolivia" specimen agreed with the available specimens collected at Lake Titicaca. Nevertheless, NABOKOV did not give any further explanation of the synonymy. Thus the name *speciosa* STAUDINGER, 1894 has been treated as available by numerous authors and listed again in *Itylos* (sensu NABOKOV!) (cf. DESCIMON (1986, Tab. 20-3) or as *Parachilades titicaca speciosa* in BRIDGES (1988: 1.326, II.81). Because of this, BÁLINT (1993a) tentatively listed the specific status of *speciosa* again, and placed it and *titicaca* in *Itylos* until the type of *titicaca* will be chequed. While the mentioned paper of the senior author was in press, one syntype specimen of *titicaca* (with a round "syntype" label added by Dr. LAMAS) was sent to him for study. Accordingly, this specimen has been designated lectotype of *Lycaena titicaca* below (Figs 11, 12, 14). Facies of this type strengthen the opinion of NABOKOV: the taxa *titicaca* and *speciosa* appear identical and we here designate *Cupido speciosa* STAUDINGER as a junior synonym of *Lycaena titicaca* WEYMER, **syn. n**.

Sex Recognition*:* Sexes of *I. titicaca* can be distinguished by FW ground colour and shape (details above in diagnosis of the species).

Intraspecific Variation*:* Some female specimens have strong bronze shade DW ground. The VFW ground is ash grey in some cases (Fig. 6). The postdiscal spots in the upper postmedian area are differently developed on several specimens: sometimes rather distinctly marked (Fig. 4), sometimes totally missing (Figs 6, 8). VHW is rather variable, the two most often phenomena: (1) the area between costal margin and vein M1 is paler (Fig. 2); (2) the ground of the median area is dark creating a wide brown band with the postbasal and postmedian markings (Figs 4, 6). In genitalia, only males show differences in development and shape of costal valval rostellum and anal process (Figs 50-52). Female genitalic structures are rather uniform according to the studied material.

Subspecies-like demes*:* Two stocks of material indicate the possibility of subspecific division, but the available material is too small to render a conclusive diagnostic treatment. We briefly characterize these entities below:

1) **deme of Ancash-Cordillera Blanca** (Figs 1-2, 17-20, 35, 41, 58). Material Available: 6 males (details in Material Examined). Additional characters: slightly different wingshape and larger size; DW ground gleaming purple blue; DHW ground fuliginous grey.

2) **deme of Tucumán-Antofagasta** (Figs 15, 16, 42, 60). Material Available: 13 males 3 females (details in Material Examined). Additional character: valval anal tip straight, spinous (Figs 42, 60).

There are no clinal changes toward these phenomena and the mentioned characters seem to be unique compared to the overall range of *titicaca*. Both entities also show distinctive geographic positions as disjunct populations peripheral to the centrally documented range of *titicaca* (Fig. 33). It is probable that when more material becomes available for study distinct subspecific status of these entities might be advised. Interestingly, the exsistence of the phenomenon Ancash was suggested before by NABOKOV (see BÁLINT 1993a: 13).

Phylogenetic Affinities and Placement: The taxon seems to be the sister species of *I. pnin*. (for additional details see below under Discussion and Appendix).

General Comments – *I. titicaca*, beside *Pseudolucia chilensis* (BLANCHARD, 1852), *P. lyrnessa* (HEWITSON, 1874) (= *zembla* BÁLINT et JOHNSON, 1993a: 6-7) and *Madeleinea koa* (DRUCE, 1876), is the most well represented South American polyommatine taxon in the European collections (cf. BÁLINT 1993a). As the types of *titicaca* and *speciosa* were never studied and compared hitherto, up to the very recently the taxon was often determined as *Itylos speciosa* in European museum collections (London, Paris, Munich, Vienna) following the misinterpretation of DRAUDT ([1921]: 822).

Type Material Examined – **Lectotype** of *Lycaena titicaca*, male (Figs 12, 14), labelled as follows: "Zool. Mus. Berlin; Syntype; Lectotypus, Lycaena titicaca, des: Zs. Bálint, 1993.III.3., Budapest". Deposited MNHU; designated here. **Lectotype** of *Cupido speciosa* designated by BÁLINT (1993a: Fig. 6), male: "Malaga, Bolivia, 4-5000, M. Garlepp '91.; Speciosa Stgr.; Origin.; Zool. Mus. Berlin; Syntype; Lectotypus, Cupido speciosa, des: Zs. Bálint, 1992.XII.2., Budapest". Deposited in MNHU.

According to the description of STAUDINGER (1894: 77-78) the type series of *Cupido speciosa*, contains at least

15 specimens, deposited in MNHU. Additional syntype specimen located elsewhere than Berlin: male, "Malaga, Garl.; Origin; 692.; Stgr., '03, Bolivia", designated here as Paralectotype, deposited in NMW. This specimen most probably was donated or exchanged by the STAUDINGER-BANG-HAAS firm before the 1st World War.

Additional Material Examined – **Peru:** 4ms: Andes, Cordillera Blanca, VII.1984, high montane 4000-5000 m elevation, DESCIMON (AMNH-HNHM); 3ms: Puno, Lac de Titicaca, Pérou (BMNH); 2ms: Galera Pass, Dpt. Junin, 4800 m., II.'00. (SIMONS), snowy season (BMNH); 1m: Vilcanota, Peru, GARLEPP, Pérou, Prov. Cuzco, Vilcanota, 3000 m, ex GARLEPP, STAUDINGER., 1899 (BMNH); 1m: Aréquipa, Pérou (BMNH); 1m: Marcapata, E. Peru, 10.800 ft., (OCKENDEN) (BMNH); 1m: Cuzco to Marcapata, 14000, SIMONS (BMNH); 1m: Cuzco, 4000 m (BMNH); 1m: Cuzco, Peru, 3500 m, coll. FORD (AMNH); 6ms 2fs: Cuzco, Peru, 4000 m (BMNH); 1m: Peru: Capachica, Alt. 12,500 ft, 19.IX.1937., G.I.CRAWFORD (BMNH); 5ms: Peru: Puno, Alt. 13,000 ft, 26.IX.1937., G.I.CRAWFORD (BMNH); 1m: Puno, Peru (BMNH); 1f: Peru, Capachica, Alt. 12.500 ft, 22.IX.1937., G.I.CRAWFORD (BMNH); 1f: Peru (BMNH). 1m: Peru: Ancash Prov., Quebrada Honda Base Camp, 1400'(!), 24.VI.1979, GIBBY & BARRETT, B.M. 1979-354; 1m: Peru: Ancash Prov., Quebrada Honda Base Camp, 1400'(!), 9.VII.1979, GIBBY & BARRETT, B.M. 1979-354. – **Bolivia**: 5ms: Bolivia, STAUDINGER (BMNH); 3ms: Boliv., Titicaca, Guaqui, V., coll W. SCHNUSE (BMNH); 1m: Yungas, Bolivia, collection ROSENBERG (BMNH); 1m: Bolivia, GARLEPP, HDC, JB; 1m 1f: Malaga, GARLEPP (BMNH); 1m: Titicacasee, Bolivia (AMNH); 3fs: Chuquicamata, Bolivia 66'W-16,5'S, 5000 m, SIMONS, in snowy páramo, 30.VII.01. (BMNH); m: Chuquicamata, Bol. 66'W-16,5'S. 5000 m, (SIMONS), dry season (BMNH); 1f: Bolivia, GARLEPP, RB; 1m: Sorata-Town, High Bolivia, Sir M. CONWAY (BMNH); 1m: High Bolivia, Sir M.CONWAY, 99-136, Umapusa, 19. Sept (BMNH); 1m: Lopaz, HEWITSON Coll. (BMNH); 2ms 1f: Huallatami, Bolivie (BMNH); 1m: Huallatami, Bolivia, 14-18000 ft, GARLEPP (BMNH); m 1f: STGR., '03, Bolivia (NMW). – **Chile**: 4ms: Parinacota, Tarapacá, 5.IV.1990, 4400 m, leg. PEÑA (AMNH-HNHM); 2ms: Parinacota, 14.I.1946, 4200 m (AMNH); 3ms: Hoyitos, E. Tocornal, Prov. Antofagasta, 3.XI.1968, coll. SOZA (coll. PEÑA); 1m: Mucar, E. Tocornal, Prov. Antofagasta, 25.III.1969, coll. SOZA (coll. PEÑA); 1m: Mucar, E. Tocornal, Prov. Antofagasta, 16.XII.1952, leg. L.E. PEÑA (coll. PEÑA); 3ms 1f: Hoyitos, E. Tocornal, Prov. Antofagasta, XI.1968, coll. SOZA (coll. PEÑA);1m 1f: Mucar, E. Tocornal, Prov. Antofagasta, 16.XII.1952, leg. L.E. PEÑA (coll. PEÑA); 1f: Mucar, E. Tocornal, Prov. Antofagasta, 18.XII.1952, leg. L.E. PEÑA (coll. PEÑA). – **Argentina**: 2 ms: Tucumán, Las Animas Portezuelo, 26.I.1979, leg. DOMINGUEZ (IML).

Slides: Brit. Mus. Nos. 17555, 17565, 17566, 17567, 17568, 17571, 17572, 19122, 19121, 19169 (ms); 17571 (fs); gen. prep. Nos. BÁLINT 330, 333, 334, 341 (ms); 335, 336 (fs).

Etymology – "Titicaca"; a noun, in apposition, used to signify the Lake Titicaca closely situated to the type locality.

Itylos pnin BÁLINT, 1993

Itylos pnin BÁLINT, 1993a: 13.

Figures – wings: Figs 21-22; male genitalia: Figs 43-46; wing venation: Fig. 65.

Diagnosis – Antennae below white. FW costal margin more convex than in *titicaca*. DW without markings, ground cool blue with relatively wide black margin indistinctly bordered inwardly. Fringes long, checkered (type 5). VFW ground light brown with indistinct polyommatine markings. VHW pattern is polyommatine type, differs from *titicaca*: basal area grey with indistinct white ringed light brown postbasal spots, median area ash grey with indistinct discoidal spot; postmedian area with row of brown spots; submarginal area grey with white markings in cells CuA$_2$, CuA$_1$ and M3; submarginal area grey with hardly visible brown marginal spots. Male genitalia with very long, pointed but bulbous and strong uncus, gnathos not so strong than that of *titicaca*; juxta not pointed, valval anal process not so developed as in *titicaca*; rostellum stronger than that of *titicaca*; aedeagus thick and very short comparing with *titicaca*; suprazonal portion twice longer than subzonal one, alulae less developed than in *titicaca*.

Female unknown.

FW length of Holotype: 8 mm.

Distribution – Known only from the type locality, W Peru (Fig. 33).

Biology – The single known specimen was collected at elevation 2000' (m?), but there is no data concerning its temporal appearance (notes about MOSS' label data are given by BÁLINT 1993b: 1-2). The taxon was captured with the types of *Eldoradina cyanea* (BALLETTO) and its synonym *Polytheclus cincinnatus* BÁLINT et JOHNSON (1993b: 2, cf. BÁLINT 1993b: 1) by M. MOSS. Its flight period must be basically synchronic with that of *E. cyanea*. LAMAS & PÉREZ (1983: 36) gives ecologic informations to *E. cyanea*, accordingly the species must fly in the second half of the dry season. The following lycaenid species are still known from Chosica based on questionable historical museum materials collected by MOSS: *Hemiargus ramon* (DOGNIN, 1887) and *Echinargus martha* (DOGNIN, 1887). Larval foodplant and the nectar sources of the adults are unknown.

Remarks – **Sex Recognition**: Only the male is known. The type specimen was incorporated to *I. titicaca* material of the BMNH, because dorsally it suggested a female of *I. titicaca*. According to the VHW pattern the two taxa can be immediately distinguished.

Intraspecific Variation: Only the single type specimen is known.

Phylogenetic Affinities and Placement: The taxon seems to be the sister species of *I. titicaca* (for additional details see below under Discussion).

General Comments – The discovery of the taxon was a great surprise because the primary type specimen was selected as a female (!) specimen of *I. titicaca* for dissection at the BMNH. The species was described by BÁLINT (1993a: 13) with additional data on its morphology and phylogenetic connection given here.

The existence of *I. pnin* emphasizes two points: (1) how little is known of some high Andean areas of Peru and their oreal polyommatine (s.l.) fauna; (2) that the existing material must be thoroughly studied because slight morphological differences (or misdiagnoses of gender) can hide unrecognized entities which structurally differ greatly from congeners. As noted by BÁLINT & JOHNSON (1993a) in the case of genus *Pseudolucia* and JOHNSON (1992b) in the case of many "elfin-like" Theclinae, this often leads to erroneous generalizations about species diversities and distributions.

Type Material Examined – **Holotype**, male, labelled as follows: "Lima to Chosica, 2000' (A. M. Moss); Rothschild Bequest, B.M. 1939-I.; Holotypus, Itylos pnin, det. Zs. Bálint, XI. 1992., Budapest". Deposited in BMNH (drawer 29A-928).

Slide: Brit. Mus. No. 19164.

Etymology – "Pnin", a Russian emigre professor in the NABOKOV's novel "Professor Pnin".

Itylos fumosus (BALLETTO, 1993)

Ityloides fumosus BALLETTO, 1993: 234.
Itylos luzhin BÁLINT, 1993: 13., **syn. n.**

Figures – wings: Figs 23-26; male genitalia: Figs 47-57; wing venation: Fig. 66.

Diagnosis – Antennae below greyish brown with rufous club. FW shape extended with pointed apex; DFW and DHW ground dark blue with wide, suffused black margin; FW discoidal patch visible; veins black; fringes unicolorous dirty brown; VFW ground colour light brown with indistinct, hardly visible polyommatine markings; basal, costal, submarginal area and veins ash grey; VHW ground colour ash grey with indistinct ityloid pattern; submarginal area ligther. Male genitalia with strong, bulbous uncus and slender but claw-shaped gnathos; tegumen relatively small with long and narrow vinculum; no appendix angularis; juxta strong with pointed arms; valval shape with large Bayard's angulation at costa and very narrow but long, strongly dentated rostellum; valval anal part rounded; aedeagus with small sheathing. Female unknown.

FW length of Holotype 8.0 mm; Paratypes: 8.0 and 8.5 mm (n=2).

Distribution – Known only from the type locality: páramo above Corongo, Ancash, Peru (BÁLINT 1993b: 1-2) (Fig. 33).

Biology – The type series was collected at elevation 3600-4000 m in the dry season, November. Only the following polyommatine lycaenid was captured with the type specimens according to BÁLINT (1993a): *Madeleinea koa* (DRUCE, 1876). Larval foodplant and the nectar sources of the adults are unknown.

Remarks – **Sex Recognition**: Only the male is known.

Intraspecific Variation: Wing pattern variation involves the degree of expression in VW markings (Figs 24, 26). In genitalia uncus apex and gnathos base shows slight variation in size and development, as well as the dentation of the costal valva rostellum, which can be assymetrical on the valve (Figs 48, 51, 54).

Phylogenetic Affinities and Placement: see below "Review of Ityloides".

General Comments – The discovery of the taxon is again a great surprise underlining the high but very poorly known polyommatine diversity in the high Andes (cf. discovery of *Paralycaeides shade*, *Madeleinea lolita* and *M. mashenka* in BÁLINT 1993a). This species is described almost a hundred years after the date of its capture and suggests that numerous "hidden" entities may still exist in institutes or museums where historical South American polyommatine collections were preserved. The description of *I. fumosus* and *I. luzhin* is based on the same specimens (BÁLINT 1993b: 1-2).

Type Material Examined – **Holotype**, male, labelled as follows: "Paramo, Coreuges, Peru, 3600-4000 m, 30.XI.99., dry seas. (Simons); Rothschild Bequest, B.M. 1939-1.; Holotypus, Itylos luzhin, det. Zs. Bálint, VIII. 1992., London". – **Paratypes**, 2 males, with the same data. Deposited in BMNH (drawer 29A-928).
Slides: Brit. Mus. Nos. 17569 (Holotype); 17570, 19170 (Paratypes).

Etymology – "Fumosus"; an adjective indicating the fumous DW and HW ground of the wings. "Luzhin"; named for the chess monomanic in NABOKOV's novel "The Defense".

Review of Ityloides BALLETTO, 1993

Short Taxonomic History – BALLETTO (1993: 232, 234) describing *Ityloides fumosus* used the supposed new entity as type species of a new monobasic genus *Ityloides*. Some misfortune resulted here because of arbitrary dates of publication and the fact that little communication had occurred concerning the preparation of research on these entities. The publication of BÁLINT was tied to names needed for a Chilean publication (L. PEÑA in litt. to JOHNSON). BALLETTO was unaware of BÁLINT's treatments of the name *Itylos*, *titicaca*, *speciosa* and of the existence of *I. pnin*. *Ityloides*, however, is a published name and requires evaluation in regard to a revisionary view of *Itylos*. As noted above, we synonymize monobasic *Ityloides* with *Itylos* for the factual and methodological reasons enumerated below.

Diagnosis of *Ityloides* – Body: eyes naked, palpy hairy, foreleg tibial spine absent, abdomen short. Wing venation: FW with veins Sc and R1 free (Fig. 66). Wing shape: FW with sligtly convex, apex pointed, inner margin short and convex, tornus rounded, anal margin very short comparing with costa. Pattern: DW ground deep smoky indigo blue with wide suffused black margin. FW with discoidal spot. Fringes brownish, fumosed, type 7. FW costa fringed at apex. VFW ground greyish brown with suffused polyommatine resembling markings. VHW pattern ityloid: ground colour greyish brown with darker discoidal spot, postbasal and postmedial row; costal area with submedian dark brown spot, black median and postmedian pattern; submarginal pattern indistinct, suffused. Androconial scales: absent. Male genitalia: whole dorsum (uncus + gnathos + tegumen) remarkably similar in type to polyommatine lycaenids, characterized by well developed uncus, smaller gnathos and stronger tegumen; uncus digitate with about the same lentgh as juxta, straight with bulbous, rounded apex, apical lobe dentated; ganthos shorter than uncus (about 5/6 length of that of uncus) and pointed with strongly shouldered base; tegumen and vinculum with about the same length, cca. equal with the length of aedeagus' subzonal part, appendix angularis absent; juxta saddled and slightly curved invardly, somewhat shorter than the subzonal part of the aedeagus; with short but well developed arms and pointed apex; valva wide with strongly angulated but rounded costa, rostellum thick but strongly dentated, anal margin sligthly convex, strongly sclerotized with pointed apex; aedeagus straight, long, suprazonal length about one third as that of subzonal; suprazonal part thin with extanded sclerotized lateral edges (CHAPMAN's process), pointed at apex, about two third longer than vesica; vesica very simple and weak; subzonal part cylindric; alulae very small, sagum absent. Female: Unknown.

Synopsis of the Species – *Ityloides* was monobasic, including only *Ityloides fumosus* BALLETTO, 1993.

Evaluation of Status – **Characters of Ityloides***:* *Ityloides* was characterized as showing (1) strong, bulbous uncus apex with dentated lobe, (2) thin, long and dentated costal process of valve, (3) penis with screlotized and straight suprazonal edges, (4) very week alula. These genitalic structural characters are unique to *I. fumosus*. However, there is no evidence at this time concerning which of the unique chararacters of *I. fumosus* are apomorphic. *I. pnin* has also bulbous uncus but without dentation; the sclerotized edges of suprazonal part of the penis are also present in *I. titicaca* although the structure is curved and longer compared to the subzonal portion. The valval rostellum on *I. fumosus* cannot be compared with any polyommatine occuring in South America. However, the alulae of *I. titicaca* and *I. pnin* are consideribly smaller when compared with other South American polyommatines (e.g. *Paralycaeides*) and *I. fumosus* represents the most least developed alulae (after *Madeleinea* species) which may be a primitive condition. Considering these character distributions, our view of the monophyly of *Itylos* and *Ityloides* (and the status of the latter) involves both matters of character comparison and methodology.

Monophyly – Characters of Itylos and Ityloides: The monophyly of the two taxa can be confirmed by the following character states, some of which are ambiguous at the present time relative to apomorphy: (1) similar wingshape, (2) VHW pattern of the same type, (3) absence of suspensorium, (4) very small valvae with large penis, (5) the same center of origin.

The very short FW anal edge is a remarkable character among South American polyommatines. Similar, certainly convergent, phenomena are known among high altitude polyommatine lycaenids in the Palearectic region (*Albulina* TUTT, 1909 and *Agriades* HÜBNER, 1819 s.l. groups of taxa) and in the Afrotropical region (genus *Harpendyreus* HERON, 1909), but their measurements give a different picture (cf. LARSEN 1991: *Harpendyreus aequatorialis* (E. SHARPE, [1892]) Pl. 24, Fig. 323; SAKAI 1981: "*Polyommatus erigone* GR.GR., 1890", Pl. 45, Figs 1-3; "*Agriades pheretides* (EVERSMANN, 1843)", Pl 24, Figs 5-23).

The *titicaca* type of pattern (ityloid sensu NABOKOV 1945) can be easily originated from the *pnin* and *fumosus* types, which are very closely related. Thus, it appears that the ityloid pattern evolved secondary from the polyommatine type (chatochrysopoid sensu NABOKOV 1945: 45) as also suggested by the distributional data of some Latin American polyommatines. Otherwise, the polyommatine type of pattern has a worldwide distribution in oreal habitats, while the ityloid pattern (which is the most represented in South America) appears mainly in high altitude enviroments whole over the world [e.g. *Lycaeides lamasem* (OBERTHÜR, 1910) in Himalaya (Figs 31-32), *H. aequatorialis* on Kilimanjaro and Mt. Kenya (Figs 29-30), *M.* sp. n. prope *koa* in Ecuadorian Andes (Figs 27-28)]. This phenomenon must be highly adaptive depending on similar environmental pressures.

The absence of the suspensorium on the tegumen is a common, obvious charcter state, because it is even represented on the thecline-like neotropical polyommatine lycaenids (BÁLINT & JOHNSON 1994).

Also worthy of mention here are the anastomosed FW coastal veins of genus *Itylos*. This is well represented by several taxa of the *Polyommatus* section (ELIOT 1973, HIROWATARI 1992), but it is typical for the plesiochor groups mainly with Oriental and Australian distributions. The "modern" polyommatines (sections *Eicochrysops, Lycaenopsis, Glaucopsyche, Euchrysops* and *Polyommatus*) have the fore wing with veins Sc and R1 free.

As noted before, the genitalic structures in the case of *Itylos* and *Ityloides* are unique. These can be originated from a common ground plan, as the somewhat transitional position of *I. pnin* between *I. fumosus* and *I. titicaca* suggests. *I. pnin* is closer in some morphological and structural aspects to *I. fumosus* than to *I. titicaca*. The *titicaca* penis, with strong sclerotized and curved suprazonal edges, is rather reminiscent to that of genus *Danis* FABRICIUS, 1807 (HIROWATARI 1992: 73) but we think the *fumosus*, and even the *pnin* type of penis, with their more simple structures, reflect the more ancient habitus (genus *Psychonotis* TOXOPEUS, 1930 in *Danis* section [cf. HIROWATARI 1992: 75]. Consequently, *I. titicaca* is apparently the most progressive species of the monophyletic unit (aside from the above-mentioned FW venation), with strongly developed ityloid VHW markings, and very long and slender uncus and gnathos.

All of three species of the unit can be found in central Peru, indicating a common chorological center. Only *titicaca* is found southward, to Tucumán (Argentina) (although this could be the result of the insufficient samples). The three entities *fumosus*, *pnin* and the *titicaca* complex form a tightknit monophyletic unit with an obvious outgroup quite unapparent at present. It is possible that a sister group may be indicated eventually through elaboration of additional historical material or from modern fieldwork.

Monophyly – Methodology: We unite *Itylos* and *Ityloides* into a separate Neotropical entity (namely, the *Itylos* section [*Ityloides* in synonymy]) within the tribe Polyommatine and characterize it below according to the terminology and criteria of ELIOT (1973). We have indicated above our view of characters in members of this *Itylos* section. These appear to obviate any validity of *Ityloides* as monobasic sister genus of *Itylos* for the following reasons.

There is probably only one factual criterion in phylogenetic systematics by which BALLETTO's *Ityloides* might be considered noncongeneric with this assemblage. This would include documentation of a sister species sharing the generic characters of *Ityloides* (but differing from *I. fumosus*) and which, with its sister, comprised a lineage of equal cladistic rank with the other members of *Itylos* s. str. (e.g. *pnin* and the *titicaca* complex).

Another possibility for recognizing *Ityloides* is entirely methodological. This would include documentation that the characters of *I. fumosus* itself comprise, in comparison to all other *Itylos*, the apotypic sister lineage as distinguished by at least one autapomorphy (as in the case of recognition of monobasic *Pseudochrysops* NABOKOV, 1945).

At present there are two problems. First, since all members of *Itylos* as herein defined show autapomorphies, one could recognize *Ityloides* as a genus only if a separate genus was erected for each species in this small clade. Second, it appears that the *titicaca* complex is the more apotypic member of the group. Further, the case does not compare to the quadrad of polyommatines containing *Hemiargus* HÜBNER, [1818], *Cyclargus* NABOKOV, 1945, *Echinargus* NABOKOV, 1945 and *Pseudochrysops*. Here, all the genera are diverse except the apotypic lineage (monotypic *Pseudochrysops*, which also shows an unequivocal sister group of equal rank within the rest of the four taxon statement) (JOHNSON & BÁLINT in prep.).

Contrasting the tightknit members of our *Itylos* section, most systematists agree generically lumping *Hemiargus*, *Cyclargus*, *Echinargus* and *Pseudochrysops* simply because of overall monophyly largely obfuscates character and biogeographic relationships within this speciose group (see SMITH, MILLER & MILLER, in press). Finally, and again contrasting the situation of *I. fumosus*, the monobasic unit of *Pseudochrysops* has recently been shown to occur on more than one major crustal block of the Greater Antilles. Thus, when elaborated, this population may comprise the sister species of *P. bornoi* (COMSTOCK and HUNTINGTON, 1943) and remove *Pseudochrysops* from scrutiny as a monotypic unit.

DISCUSSION

Generic Limits of *Itylos* as Herein Defined and Consideration of Outgroups – *Itylos* can be characterized by (1) very long uncus with produced tegumen suspensorium absent, (2) valvae strongly sclerotized and with unique shape amongst polyommatines (exceedingly small and squat, equalling about half of the entire penis), (3) strong and robust penis with highly developed suprazonal element.

These character states occur in all the known *Itylos* species and were properly described by NABOKOV for the *titicaca* complex in his generic description of *Parachilades* (NABOKOV 1945: 6-10). In his text NABOKOV made comparisons mainly with *Chilades* MOORE, 1861 taxa, suggesting some parallel evolutionary processes affecting the male genitalic structures enumerated above as character states. *E. cyanea* and *E. sylphis* have a similar valval shape but the costal valval rostellum, as well as the anal valval process, show another kind of structural shape (BÁLINT & JOHNSON 1994, Figs 31-32). The structure of penis in *Itylos* is also unique among the South American and austral polyommatine lycaenids. All other known South American polyommatine are structurally very different, none appearing to be a likely sister group.

The *Itylos* section, Phylogenetic Considerations and Placement According to the Criteria of ELIOT – According to ELIOT (1973: 450) *Itylos* shares the following diagnostic characters of the *Polyommatus* section:

"Forewing with veins 11 and 12 free, hindwing tailess, battledore scales commonplace except *Itylos* [= *Madeleinea* BÁLINT] in which the outer margins are excavate or crenulate, in addition 'gelbe schuppe' may be present; eyes and palpi variable, male genitalia with lobes of uncus more or less digitate and directed caudad; a suspensorium, comprising a pair of rather weakly sclerotized arms descending from the top of the inner faces of the lateral processes of tegumen, is nearly always present; penis generally similar to that of the *Euchrysops* section, with alulae at the zone; in Neotropical species a sagum is nearly always present".

These characteristic features are discussed in detail below concerning *Itylos* as defined in the present revision.

Venation: According to ELIOT (1973: 397) abnormalities of fore wing veins 12, 11 and 10 are frequent in Polyommatini where they usually provide good section characters. The FW veins SC and R1 are differently presented in *Itylos* than the normal *Polyommatus* type (although similar in *I. fumosus*, probably as primitive). This abnormality is also present in the *Catochrysops* section, where *Catochrysops* BOISDUVAL, 1832 has costal veins touching but *Rysops* ELIOT, 1973 has them free.

Wing size and shape: The *Itylos* wing shape, with its small size, is unique amongst the genera of the *Polyommatus* section. Similar phenomena exist among Himalayan high altitude polyommatines (D'ABRERA 1993: 493-494).

Pattern: VFW pattern of *Itylos* is normal polyommatine. The VHW pattern was characteristicly called ityloid by NABOKOV (1945: 45-46) but this most probably evolved from the polyommatine type. It is a highly adaptive character (see above) but its phylogenetic importance is not yet clear.

Scales: Androconial scales absent (quite remarkable shape in the case of taxa redefined by BÁLINT (1993a) as *Madeleinea* (ELIOT 1973, Fig. 145).

Eyes and palpi: according to ELIOT (1973: 393) in Polyommatinae these are of little help in classification even at generic level.

Male genitalia: The male genitalia are very distinctive in several aspects compared with genera of the *Polyommatus* section described and discussed above. The absence of suspensorium is very characteristic. The phenomenon of the sagum, which is very characteristic for Neotropical genera according to ELIOT (1973: 450), is missing in all the taxa of *Itylos*.

Female genitalia: These are very distinct from the general polyommatine type, more comparable to that of *Leptotes*-type (cf. SCHWARTZ and JOHNSON 1992, Fig. 2.).

Distribution: Restricted to the Neotropics, in the Southern Andean biogeographical province.

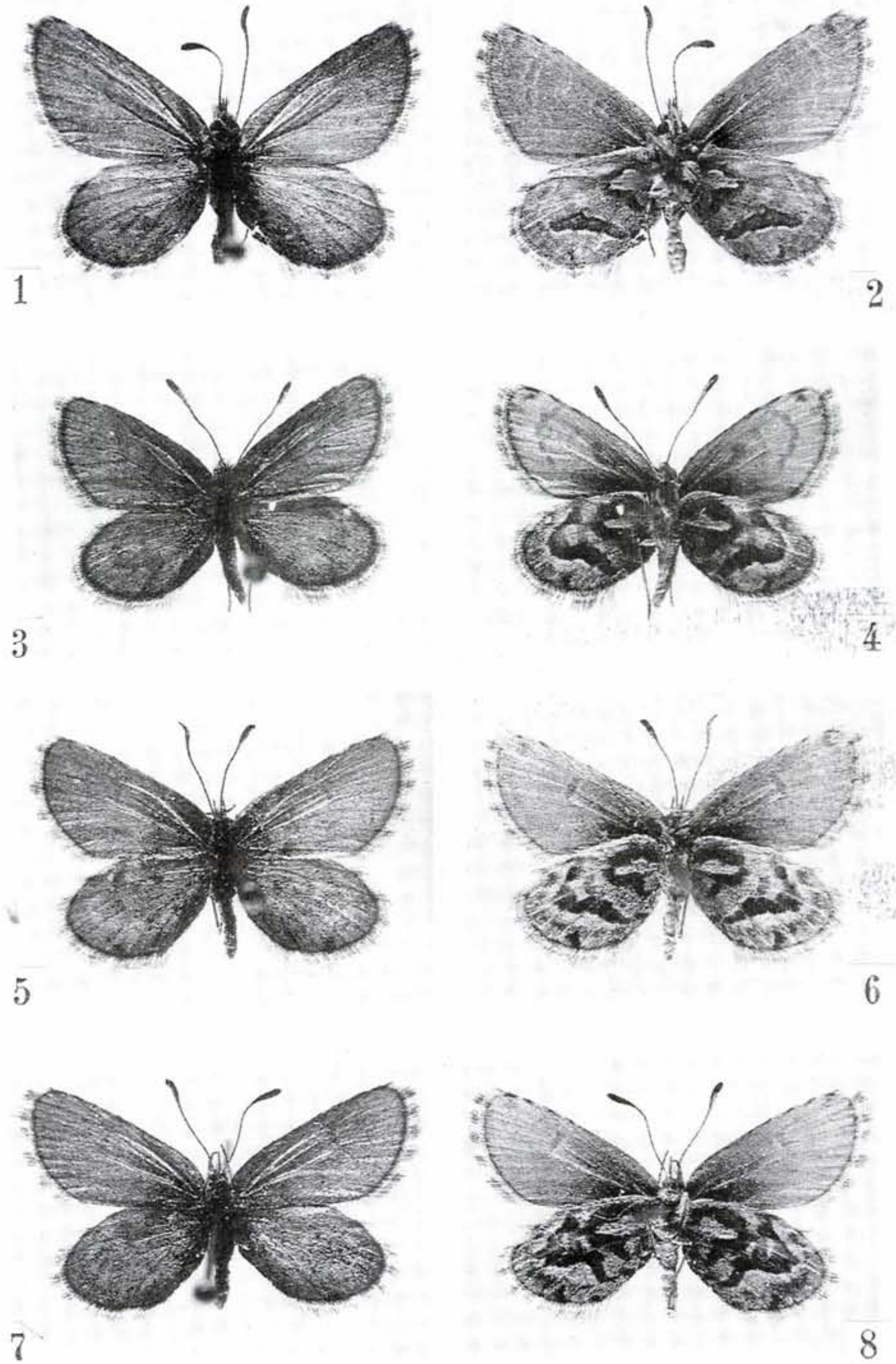
CONCLUSION

We have revised herein the *Itylos* section of the Polyommatini. We have clarified the nomenclatorial problems surrounding the name *Itylos*, the validity of type species variously attributed to it, and the relation of the generic name *Itylos* to others which are either invalid, unrelated, or for which there is no sound factual or methodological basis.

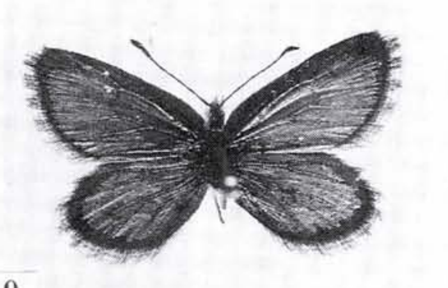
As *Itylos* appears not directly monophyletic with the *Polyommatus* section sensu ELIOT (1973), we suggest the *Itylos* section as a separate Neotropical entity within the tribe Polyommatini. As such it can be characterized according to the style of ELIOT (1973) as follows:

Itylos section – Fore wings with veins 11 and 12 touching briefly (free in one member showing the primitive condition). Hind wing tailess. Battledore scales absent. Eyes nacked and palpi hairy. Male genitalia with straight and well developed lobes of uncus and gnathos; suspensorium absent; valve short with strong sclerotized apical formations; penis large with sclerotized Chapman's process. Neotropical.

Included genera: *Itylos* DRAUDT, [1921] (*Ityloides* BALLETTO, 1993, synomym).



Figs 1-8. *Itylos titicaca* (WEYMER). 1 = male, dorsal, Cordillera Blanca, Peru, 2 = ditto, ventral, 3 = male, dorsal, Parinacota, Tarapacá, Chile, 4 = ditto, ventral, 5 = female, dorsal, 6 = ditto, ventral, 7 = female, dorsal, 8 = ditto, ventral (all HNHM)



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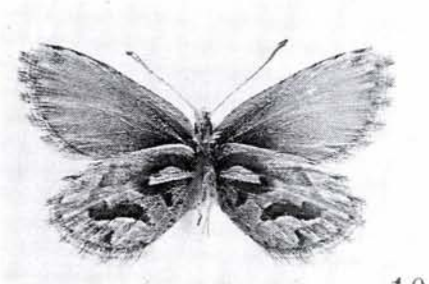

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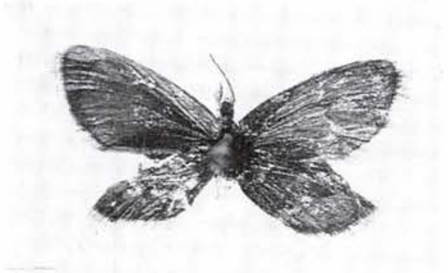

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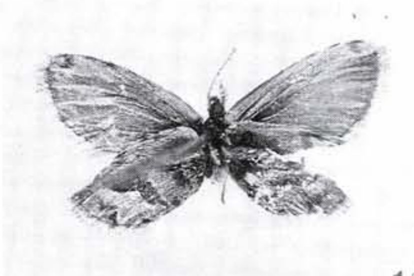

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Parachilades
titicaca Weymer
(= speciosa Stdgr.)
det. V. Nabokov

Titicacasee
Bolivia

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Collection
E.I. Huntington
No. 1053

titicaca♂
Weymer

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Lycaena Titicaca

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SYN-
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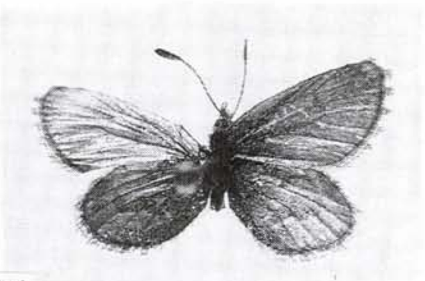

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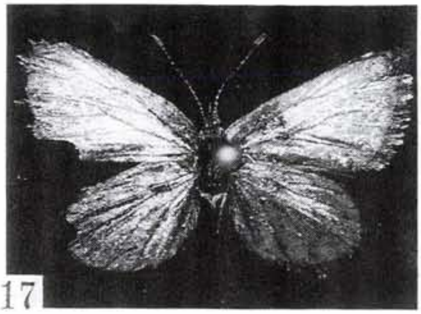
Figs 9-16. *Itylos titicaca* (WEYMER). 9 = male, dorsal, Cuzco, Peru (studied by NABOKOV) (AMNH), 10 = ditto, ventral, 11 = Lectotype, dorsal (ZMHU), 12 = ditto, ventral, 13 = labels of specimen 9-10, 14= labels of specimen 11-12, 15 = male, dorsal, Tucumán, Argentina (IML), 16 = ditto, ventral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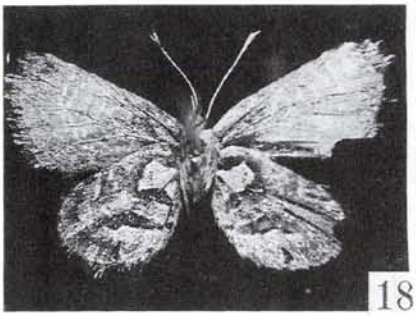
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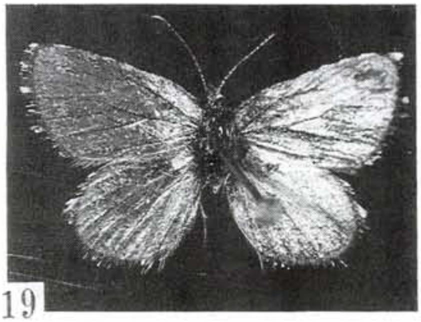
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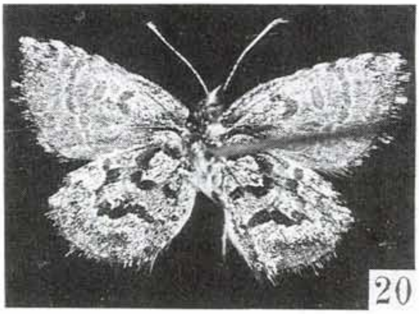
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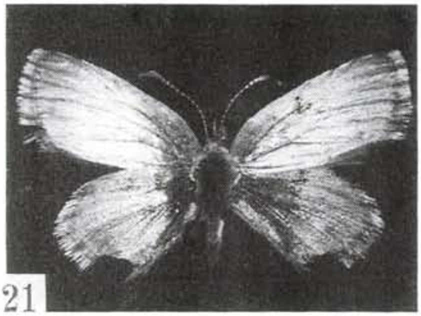
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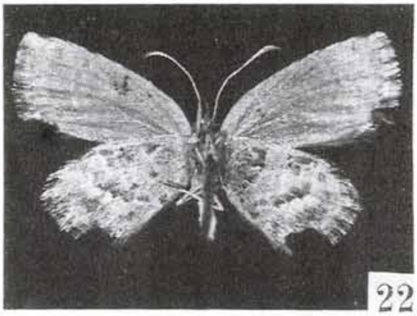
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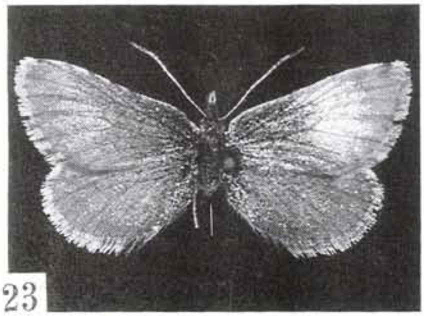
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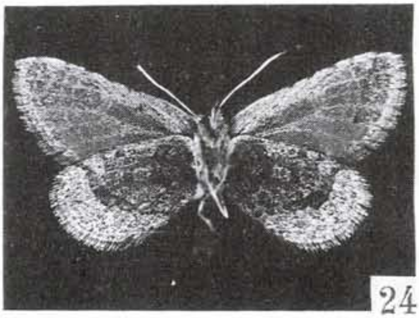
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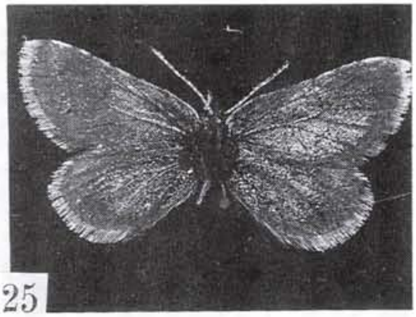
Figs 17-24. *Itylos spp.* 17 = *I. titicaca*, male, dorsal, Ancash, Peru (BMNH), 18 = ditto, ventral, 19 = *I. titicaca* (WEYMER), male, dorsal, Ancash, Peru (BMNH), 20 = ditto, ventral, 21 = *I. pnin* BÁLINT, Holotype (BMNH), 22 = ditto, ventral, 23 = *I. fumosus* (BALLETTO), Holotype (Paratype of *I. luzhin* BÁLINT, BMNH), 24 = ditto, ventral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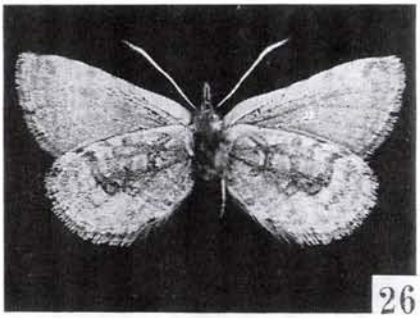
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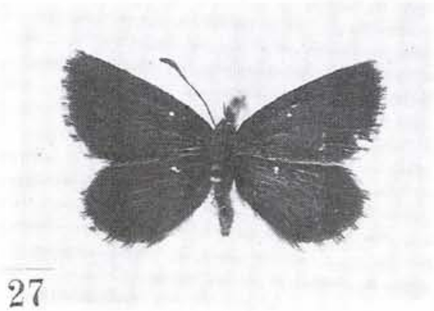
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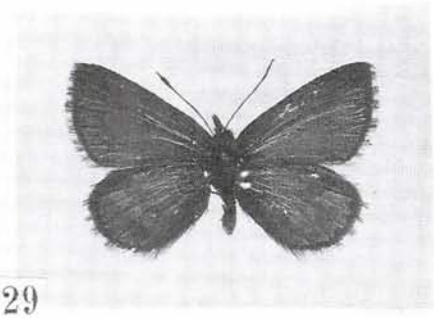
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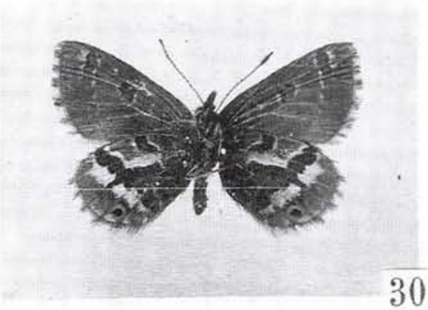
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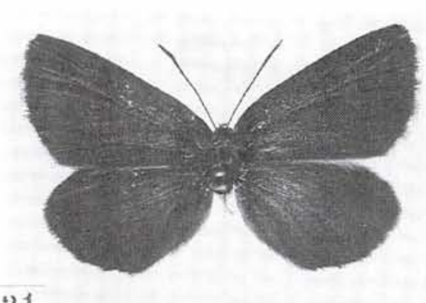
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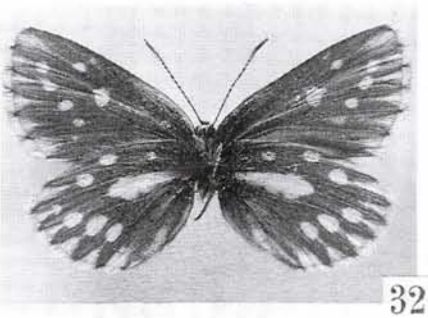
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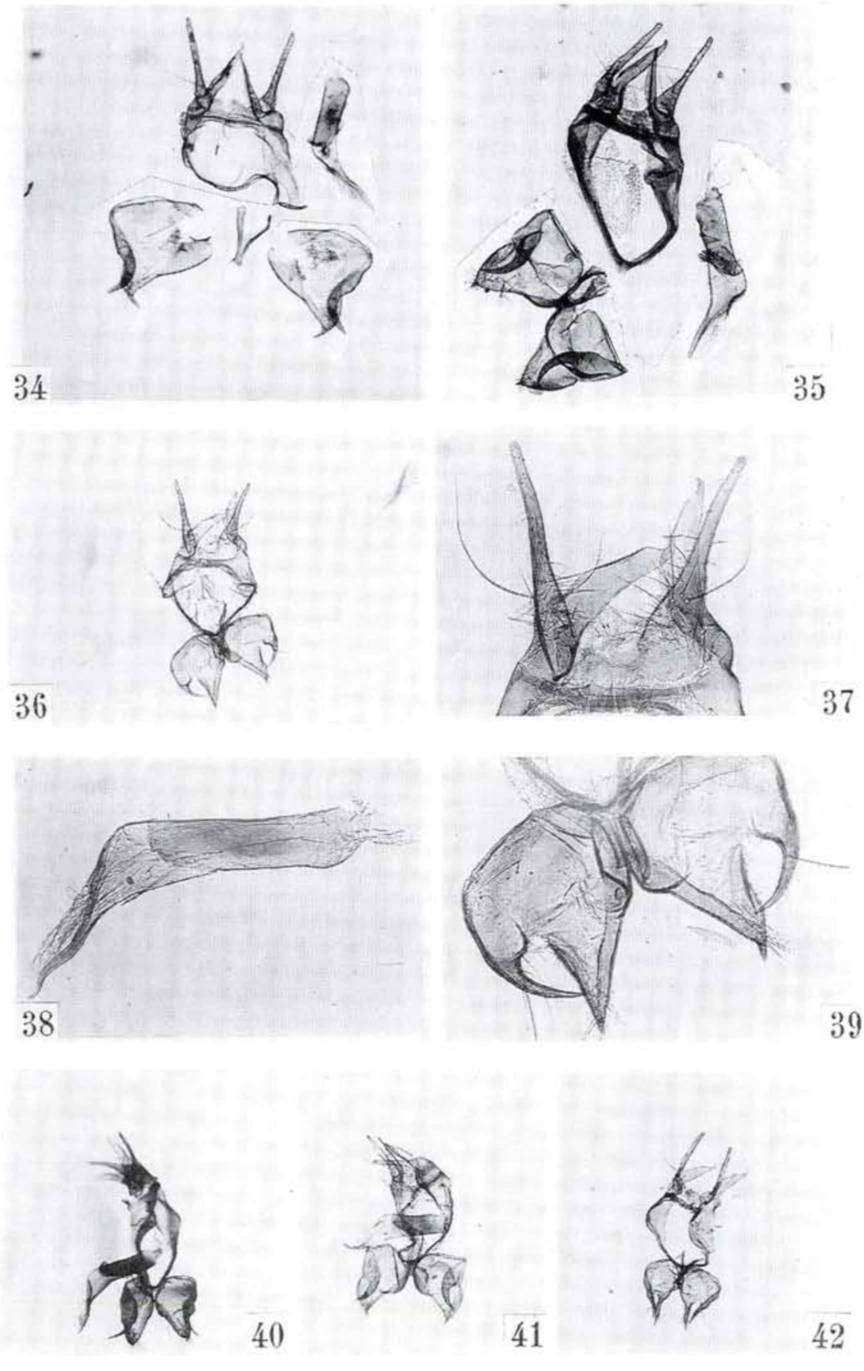
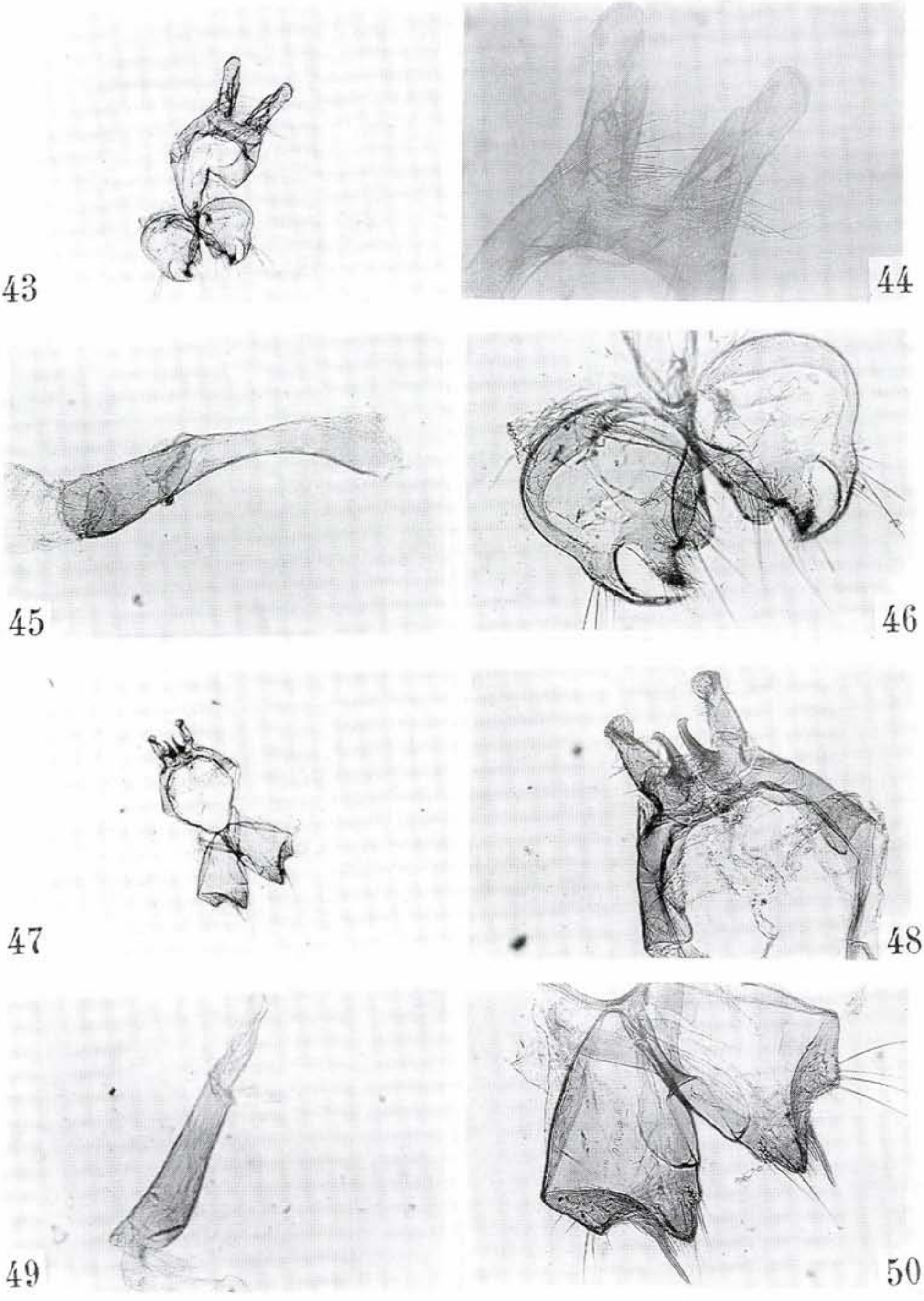
Figs 25-26. *Itylos fumosus* (BALLETTO), Paratype (Holotype of *I. luzhin* BÁLINT). 25 = dorsal, 26 = ventral. Figs 27-32. Ityloid patterns of different polyommatine lycaenids. 27 = *Madeleinea* sp. n. prope *koa* (DRUCE), male, dorsal, Pifo, Ecuador (MHNP), 28 = ditto, ventral, 29 = *Harpendyreus aequatorialis* (SHARPE), male, dorsal, Kilimanjaro, Tanzania, dorsal (MHNP), 30 = ditto, ventral, 31 = *Lycaeides lamasem* (OBERTHÜR), male, dorsal, Syntype (ZSM), 32 = ditto, ventral

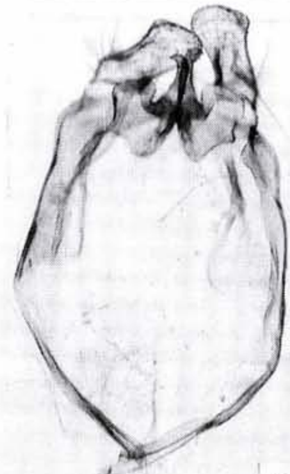
Fig. 33. Geographic distribution of *Itylos* spp. Dots = *I. titicaca* (WEYMER), triangle = *I. pnin* BÁLINT, quadrat = *I. fumosus* (BALLETTO)



Figs 34-42. Male genitalic structures of *Itylos titicaca* (WEYMER). 34 = Chicla (slide 240 BÁLINT), 35 = Ancash (BMNH 17565), 36 = Huallatani (BMNH 19169), entire structure, 37 = ditto, uncus and gnathos, 38 = ditto, aedeagus, 39 = ditto, valvae, 40 = Tarapacá (HNHM, slide 333 BÁLINT), 41 = Cordillera Blanca (HNHM, slide 330 BÁLINT), 42 = Mucar (HNHM, slide 331 BÁLINT)



Figs 43-50. Male genitalic structures of *Itylos pnin* BÁLINT (Holotype) and *I. fumosus* (BALLETTO) (*I. luzhin* BÁLINT, Paratype). 43 = *I. pnin*, entire structure (BMNH 19164), 44 = ditto, uncus and gnathos, 45 = ditto, aedeagus, 46 = ditto, ventral, 47 = *I. fumosus*, entire structure (BMNH 19170), 48 = ditto, uncus and gnathos, 49 = ditto, aedeagus, 50 = ditto, valvae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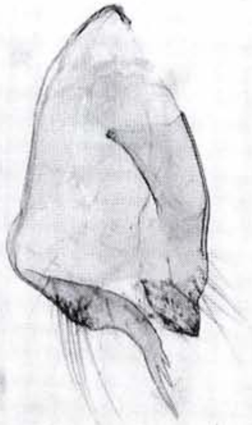
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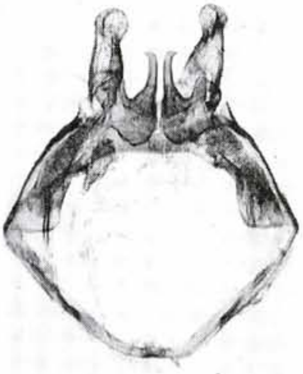
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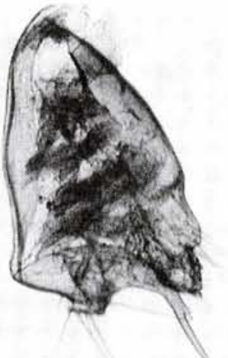
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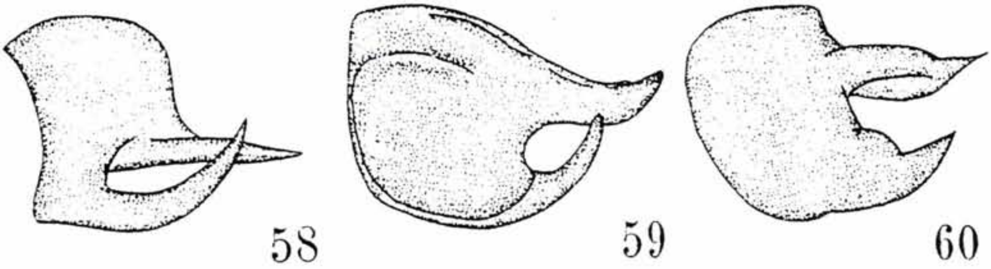
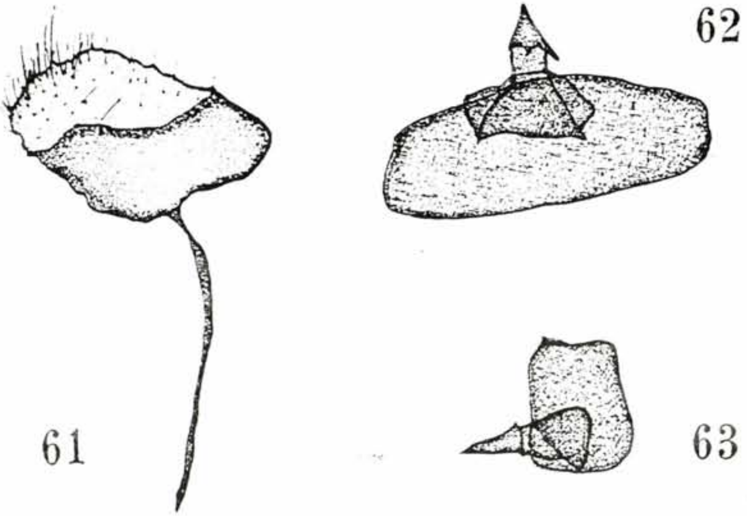
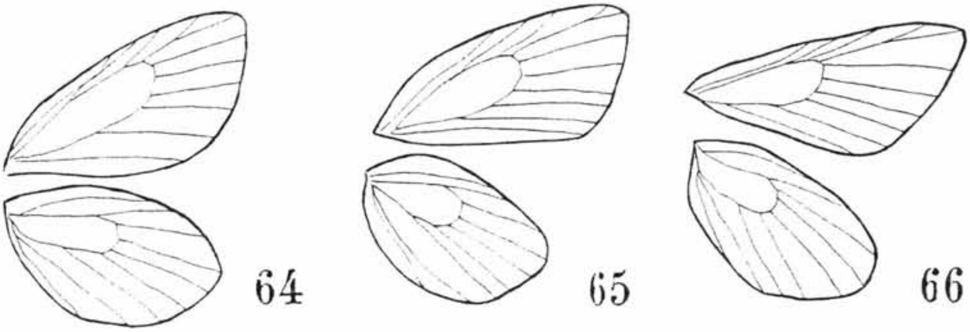
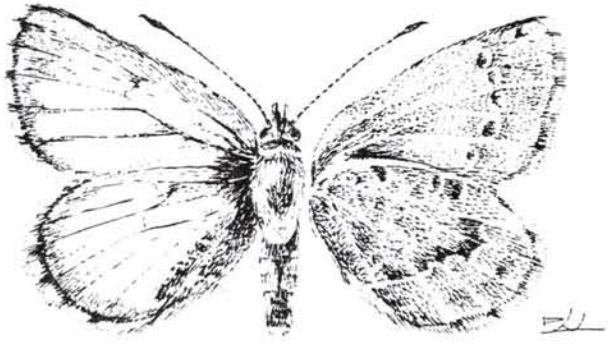
Figs 51-57. Male genitalic structures of *I. fumosus* (BALLETTO) (Paratype and Holotype) (Holotype and Paratype of *I. luzhin* BÁLINT). 51 = Paratype (BMNH 17569), uncus, gnathos and tegumen, 52 = ditto, juxta, 53 = ditto, valva, 54 = Holotype (BMNH 17570), uncus, gnathos and tegumen, 55 = ditto, juxta, 56 = ditto, valva, 57 = ditto, aedeagus







Figs 58-60. Different valval shapes of *Itylos titicaca* (WEYMER). 58 = Ancash, Peru (AMNH), 59 = Lake Titicaca, Bolivia (AMNH), 60 = Tucumán, Argentina (IML). – Figs 61-64. Female genitalic armatures of *Itylos titicaca* (WEYMER). 61 = papilla anales, 62 = henia and lamellae, dorsal view, 63 = ditto, lateral view. – Figs 64-66. Wing venation of *Itylos spp.* 64 = *I. titicaca spp.* (WEYMER), 65 = *I. pnin* BÁLINT, 66 = *I. fumosus* (BALLETTO)



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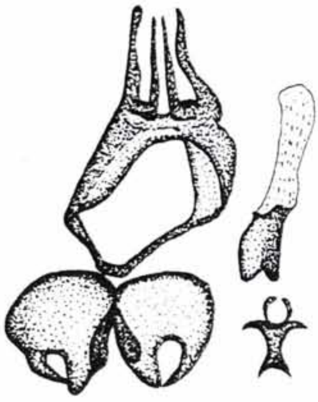

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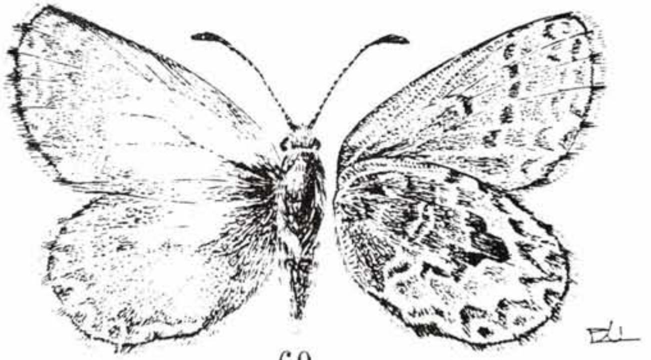

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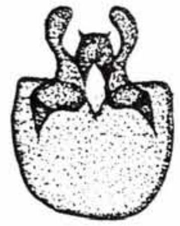

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Figs 67-70. 67 = *Itylos* sp. n. of Peru, 68 = Male genitalia of *Itylos* sp. n. (MUSM, 396, gen. prep. No. BÁLINT), 69 = *Itylos pnin* BÁLINT, female, 70 = Female genitalia of *Itylos pnin* BÁLINT (MUSM, 399, gen. prep. No. BÁLINT)

APPENDIX – ADDITIONAL NOTES ADDED IN PROOF

Dr. GERARDO LAMAS, Director of the Museo Nacional de Historia Natural de la Universidad Nacional Mayor de San Carlos (Lima, Peru) [MUSM], has collected extensively throughout Peru and discovered several lycaenid butterflies new to science. Some of these were reported in the literature (e.g. LAMAS & PÉREZ 1983, Figs 37-43) but not formally described. After publication of BÁLINT's (1993a) catalogue of Neotropical Polyommatinae, Dr. LAMAS provided numerous comments and also mentioned that the MUSM butterfly collection included some additional undescribed entities from the genera *Madeleinea* BÁLINT, 1993 and *Itylos* DRAUDT, [1921] (BÁLINT 1993b). Formal descriptions of these taxa are currently being prepared by the senior author and Dr. LAMAS.

Since the aim of the present paper was to revise the Neotropical *Itylos* clade, it is important to briefly summarize results which will be published subsequently by BÁLINT & LAMAS and add comments pertinent to this revision.

Taxonomic description of a new *Itylos* species

The following entity will be formally described by BÁLINT & LAMAS and, in context with the taxa of the present revision, should be looked for.

Diagnosis (Fig. 67) – Superficially most similar to *I. pnin* BÁLINT, 1993 but with VHW postmedian band more prominent. Male genitalia (Fig. 68) fitting the clade including *I. pnin* and *I. titicaca* (WEYMER, 1890) but with male genital uncus and gnathos more elongate and slender, aedeagus shorter and with large bulbous vesica. Female: Unknown.

Current data – The species is currently knwon from a single male labelled "Peru, PA, km 300, Carrt. Lima-Huánuco, 4300 m, 31.V.'78., G. LAMAS", genitalia dissection 396, gen. prep. No. BÁLINT, in glycerin vial, deposited in MUSM. Dr. LAMAS notes that the locality as "4300 m, Pasco, 300 km Carretera, Lima-Huánuco, Peru".

Female genitalia of *Itylos pnin*

The original description of *I. pnin* was based on a single male specimen misidentified by former NHM curators as female *I. titicaca* (BÁLINT 1993a). Subsequently Dr. LAMAS located a female specimen (Fig. 69) at the MUSM which he and the senior author have identified as the female of *I. pnin*. The association is based on (1) similar wing shape; (2) identical coloration of antennae; (3) identical VHW pattern and (4) collecting locality in same region as type locality of *I. pnin*.

The specimen is labelled as follows: "Peru, Huánuco, Pachas, 3450 m, 23.VIII.1965, P. Hocking"; genitalia dissection is gen. prep. No. 399, BÁLINT, in glycerin vial, deposited in MUSM.

Female genitalia (Fig. 70) – In dorsal view, the henia are heavily sclerotized and the fibula bilobed; the apical lobes long and rounded, the dorsal lobes wide and pointed and the central element tubular. In ventral view, apical fibular process is elnogate (quite equal to length of anterior lamella) and slightly curved; the ductus bursae is short (about the same length as the henia) and the anterior apohysis of the eighth tergit short and stout.

Comparative Remarks

Phylogenetically, the new Peruvian *Itylos* species fits well into the character transformation series we have previously elaborated (see "Review of *Ityloides* BALLETTO, 1993", above). The new Peruvian *Itylos* appears to be the sister species of *I. pnin* and these sister couplet of *I. titicaca*.

The unique female genitalic structures of *I. pnin* indicated corroborate our proposal to remove *Itylos* from ELIOT's *Polyommatus*-section and create an additional section. Female genitalia typifying the *Polyommatus* section show a relatively long ductus bursae (three or more times longer that that of henia) which is evertable. The ductus bursae of *Itylos* is not evertable and accompanies an extremely sclerotized fibula adjacent the henia. The *Itylos* female genitalic structure is more comparable to that described in ELIOT's *Leptotes* section.

The genus *Itylos*, whose four taxa show a readily interpretable transformation of structural characters (Table 1 below), is most probably an autochtonous entity of the high Andes. It has previously been mistakenly placed amongst the genera of ELIOT's *Polyommatus*-section because of poor knowledge of its morphology.

Table 1. Characters typifying the taxa *I. titicaca*, *I. fumosus*, *I. pnin* and *I.* sp. n. of Peru

DW ground

I. titicaca: violet blue with distinct black margin
I. fumosus: deep dark blue with wide black margin
I. pnin: luminous blue with suffused black margin
I. sp. n.: deep violet with wide black margin

VHW postmedian band

I. titicaca: undulate and continuous
I. fumosus: straight and continuous
I. pnin: straight and disjunctive
I. sp. n.: undulate and disjunctive

uncus of male genitalia

I. titicaca: long, straight and narrow
I. fumosus: short and bulbous
I. pnin: long, straight and thick
I. sp. n.: long, slightly curved and narrow

gnathos of male genitalia

I. titicaca: strong and very long (length almost equalling uncus)
I. fumosus: short (half uncus length)
I. pnin: strong and quite long (length approaching that of uncus)
I. sp. n.: narrow and quite long (length approaching that of uncus)

aedeagus of male genitalia

I. titicaca: suprazonal and subzonal elements of nearly equal length
I. fumosus: subzonal element 3 times length of suprazonal element
I. pnin: suprazonal element 3 times length of subzonal element
I. sp. n.: suprazonal element about 2.5 times length of subzonal element

* * *

Acknowledgements – For access to material examined we thank the following curators: P. R. ACKERY and C. R. SMITH (Natural History Museum, UK-London), W. MEY (Zoologisches Institut der Humboldt Universität zu Berlin, D-Berlin), M. LÖDL (Naturhistorisches Museum, A-Wien), F. H. RINDGE (American Museum of Natural History, USA-New York), Z. A. de TOLEDO (Instituto Miguel Lillo, ARG-Tucumán), A. M. VOJNITS (Hungarian Natural Histroy Musem, H-Budapest).

It was a particular pleasure to receive comments from Dr. GERARDO LAMAS (Peru-Lima), who kindly read the whole paper in draft and many of his criticism, corrections and suggestions are incorporated in the final text. The correspondences with professor Dr. ZOLTÁN VARGA (H-Debrecen) were very useful concerning taxonomic and biogeographic problems. Mr. J. PÁL (H - Budapest) kindly prepared Figs 67 and 69.

We also thank Dr. EMILIO BALLETTO (I-Torino) for informing us late in this study of a forthcoming list of some Andean Polyommatinae and apologize for any misunderstandings or problems resulting from the arbitrary publication dates of names by various journals. It is likely that, had we had additional information earlier, we would have proceeded differently in deference to coworkers.

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