

Taxonomic revision of the North African species of the genus *Plebejus* KLUK, 1802 (Lepidoptera : Lycaenidae)

Willy DE PRINS, Dirk VAN DER POORTEN & Zsolt BÁLINT

Abstract. Lectotypes are designated for *Lycaena allardi* OBERTHÜR, 1874, *Lycaena vogelii* OBERTHÜR, 1920 and *Lycaena allardi ungemachi* ROTHSCHILD, 1925. A neotype is designated for *Lycaena martini* ALLARD, 1867. The authors show with morphological and ecological characters that *Plebejus martini* (ALLARD, 1867) and *Plebejus allardi* (OBERTHÜR, 1874) are not conspecific, as is generally assumed in the current entomological literature. Both species belong to the subgenus *Plebejides* SAUTER, 1968. *Lycaena allardi ungemachi* ROTHSCHILD, 1925 is sunk as a synonym of *Lycaena martini* ALLARD, 1867. *Plebejus vogelii* (OBERTHÜR, 1920) apparently belongs to a different group for which BÁLINT erected a new genus *Maurus* in 1991. In this paper the authors consider *Maurus* as a subgenus of *Plebejus* KLUK, 1802.

Samenvatting. Taxonomische revisie van de Noordafrikaanse soorten uit het genus *Plebejus* KLUK, 1802 (Lepidoptera : Lycaenidae)
Er worden lectotypes aangewezen voor *Lycaena allardi* OBERTHÜR, 1874, *Lycaena vogelii* OBERTHÜR, 1920 en *Lycaena allardi ungemachi* ROTHSCHILD, 1925. Voor *Lycaena martini* ALLARD, 1867 wordt een neotype aangewezen. De auteurs tonen met morfologische en ecologische kenmerken aan dat *Plebejus martini* (ALLARD, 1867) en *Plebejus allardi* (OBERTHÜR, 1874) niet conspecifiek zijn, zoals in de moderne entomologische literatuur algemeen wordt aangenomen. Beide soorten behoren tot het subgenus *Plebejides* SAUTER, 1968. *Lycaena allardi ungemachi* ROTHSCHILD, 1925 wordt gesynonymiseerd met *Lycaena martini* ALLARD, 1867. *Plebejus vogelii* (OBERTHÜR, 1920) behoort tot een andere groep waarvoor BÁLINT in 1991 het genus *Maurus* beschreef. De auteurs beschouwen *Maurus* in dit artikel als een subgenus van *Plebejus* KLUK, 1802.

Kivonat. A *Plebejus* KLUK, 1802 génusz északafrikai képviselőinek taxonómiai revíziója (Lepidoptera : Lycaenidae)
Lectotípus kijelölés a *Lycaena allardi* OBERTHÜR, 1874, *Lycaena vogelii* OBERTHÜR, 1920 és a *Lycaena allardi ungemachi* ROTHSCHILD, 1925 taxonok számára. A *Lycaena martini* ALLARD, 1867 esetében Neotípus kijelölésére kerül sor. A szerzők alakítási és ökológiai karakterek segítségével bizonyítják, hogy a jelenlegi entomológiai irodalomban olvashatókkal ellentétben, a *Plebejus martini* (ALLARD, 1867) és a *Plebejus allardi* (OBERTHÜR, 1874) nem konspecifikusak. Mindkét faj a *Plebejides* SAUTER, 1968 szubgénuszba tartozik. A *Lycaena allardi ungemachi* ROTHSCHILD, 1925 a *Lycaena martini* ALLARD, 1867 szinonimjának bizonyult. Külön csoportba tartozik a *Plebejus vogelii* (OBERTHÜR, 1920), számára 1991-ben BÁLINT a *Maurus* génuszt állította föl, amelyet ebben a dolgozatban a szerzők a *Plebejus* KLUK, 1802 szubgénuszának tartanak.

Résumé. Révision taxonomique des espèces nord-africains du genre *Plebejus* KLUK, 1802 (Lepidoptera : Lycaenidae)
Les lectotypes de *Lycaena allardi* OBERTHÜR, 1874, *Lycaena vogelii* OBERTHÜR, 1920 et *Lycaena allardi ungemachi* ROTHSCHILD, 1925 sont désignés. Un néotype est désigné en ce qui concerne *Lycaena martini* ALLARD, 1867. Les auteurs démontrent, grâce à des caractéristiques écologiques et morphologiques, que *Plebejus martini* (ALLARD, 1867) et *Plebejus allardi* (OBERTHÜR, 1874) ne sont pas conspécifiques, comme régulièrement mentionné dans la littérature moderne. Les deux espèces appartiennent au sous-genre *Plebejides* SAUTER, 1968. *Lycaena allardi ungemachi* ROTHSCHILD, 1925 est mis en synonymie avec *Lycaena martini* ALLARD, 1867. *Plebejus vogelii* (OBERTHÜR, 1920) appartient à un autre groupe pour lequel BÁLINT a décrit le genre *Maurus* en 1991. Dans le présent article, les auteurs considèrent *Maurus* comme un sous-genre de *Plebejus* KLUK,

Key words : *Lycaena martini* - *Lycaena allardi* - *Lycaena allardi ungemachi* - *Lycaena vogelii* - *Plebejus* - Lectotype - Neotype - Synonym - North Africa

De Prins, W. : Diksmuidelaan 176, B-2600 Antwerpen.

van der Poorten, D. : Lanteernhofstraat 26, B-2140 Antwerpen.

Bálint, Zs.: Hungarian Natural History Museum, Baross utca 13, H-1088 Budapest, Hungary.

Introduction

The main reason to start the following study was the capture by the second author on the island of Jerba (Tunisia) of a series of a blue Lycaenid that with the current literature could only be identified as *Plebejus martini allardi* (OBERTHÜR, 1874). In the Instituut voor Taxonomische Zoölogie (Zoölogisch Museum) (Amsterdam) the first two authors found a series of the same species from Libya. We failed to find any published record of this species for either Tunisia or Libya. The species is mentioned here for the first time from both these countries. While studying the male genitalia of North African specimens of *Plebejus* from different provenances, it became clear to us that the taxa *martini* and *allardi* are not conspecific.

Historical review

In 1867 ALLARD described *Lycaena Martinii* (spelt also *Lycaena Martini*) in the same paper) after 10 or 12 females («dix ou douze exemplaires») which he caught between 1864 and 1866 at Lambessa (Algeria). The male was unknown at that time. BOISDUVAL and GUENÉE presumed that this species should be placed close to *Lycaena bellis* EVERSMANN (recte FREYER, 1843) [= *Cyaniris semiargus* (ROTTEMBERG, 1775)] (ALLARD 1867). KIRBY (1871) transferred the species to *Cupido* SCHRANK, 1801. STAUDINGER (1871) mentioned the species as «v. ?» under *Lycaena Zephyrus* FRIVALDSKY, 1835.

In 1874 OBERTHÜR described *Lycaena Allardii* after two males, caught by ALLARD at Seb dou (Algeria). The same author described in 1876 the male sex of *Lycaena martini* after material from Lambessa and Jebel-Aurès («très grande quantité d'individus des deux sexes») and compared this taxon with *Cyaniris semiargus* and not with his own *allardi*. OBERTHÜR (1884) described the female of *Lycaena allardi* from 1 female caught at Seb dou.

HEYNE (1895) considered *martini* as a distinct species, related to *Lycaena Zephyrus* FRIVALDSKY, 1835, but placed *allardi* as synonym of f. *icarinus* SCRIBA, 1791 of *Polyommatus icarus* (ROTTEMBERG, 1775). STAUDINGER (1901) presumed that *allardi* is only an individual form of *Lycaena Sephyrus* FRIVALDSKY, 1835. The same opinion is followed by SEITZ (1909). This author however, compared *martini* with *Polyommatus icarus* and stated that *martini* is certainly not related with *Cyaniris semiargus* as earlier authors presumed.

OBERTHÜR (1910) was the first author to compare *allardi* with *martini* : «*Allardi* est plus voisine de *Martini* que de toute autre espèce. En serait-elle même la forme orientale algérienne, tandis que *Martini* resterait l'expression

occidentale d'une même unité spécifique? Je ne le crois pas; tous les exemplaires étant si facilement et si nettement distincts les uns des autres; mais on pourrait à la rigueur exprimer une opinion dans ce sens.» He considered *allardi* much rarer than *martini*, possessing about 30 specimens of the former in his collection and about 150 of the latter. Until then, both taxa were only known from Algeria.

COURVOISIER (1914) mentioned both taxa (*martini* and *allardi*) as distinct species in the genus *Lycaena* FABRICIUS, 1807. In 1914 OBERTHÜR expressed again the possibility of the conspecificity of both taxa : «Il est possible que les deux *Lycaena Martini* et *Allardi* soient les deux formes orientale et occidentale d'une même espèce.»

In 1920 OBERTHÜR described *Lycaena Vogelii* after some specimens (at least 20) captured by H. POWELL. In fact, his description is a copy of a detailed letter from H. POWELL.

In 1922 OBERTHÜR mentioned *allardi* for the first time outside Algeria; a male was caught by H. UNGEMACH in the Reraya Valley, Great Atlas (Morocco). Obviously, OBERTHÜR did not see this specimen as he gave no picture of it and only copied a description of the specimen kept in the Muséum d'Histoire naturelle de Paris, written by H. POWELL. The Moroccan populations were described by ROTHSCHILD (1925) as *Lycaena allardi ungemachi* from 24 males and 16 females caught by HARTERT in the Middle and Great Atlas.

BANG-HAAS (1927), BOLLOW (1930) and REISSER (1934) kept *ungemachi* under *allardi*. The latter author mentioned *ungemachi* from the Rif. ZERNY (1935) transferred the taxon to *Plebeius* KIRBY, 1871 (recte *Plebejus* KLUK, 1802). STETTER-STÄTTERMAYER (1937) described 16 infrasubspecific forms of *Lycaena allardi*.

FORSTER (1938a) mentioned *martini* from Algeria and Morocco and considered both *allardi* and *ungemachi* as subspecies of *martini*. According to this author *martini* occurs in East Algeria, *allardi* in Central and West Algeria and *ungemachi* in Morocco. Most subsequent authors followed this opinion (e.g. HIGGINS & RILEY 1970, HIGGINS 1975, HIGGINS & HARGREAVES 1983, DEVARENNE 1990, BÁLINT & KERTÉSZ 1990).

FORSTER (1938b) transferred *martini* to subgenus *Plebejus* KLUK, 1802 of *Polyommatus* LATREILLE, 1804. Also BEURET (1961) mentioned *martini* under *Plebejus*. In 1968 SAUTER described the genus *Plebejides* for *Plebejus pylaon* (FISCHER DE WALDHEIM, 1832) (sensu lato) and considered *martini* to belong to this taxon. Also *Lycaena vogelii* OBERTHÜR, 1920 was included in this genus but later studies have pointed out that *vogelii* does not belong to this group. BÁLINT (1991b) described the genus *Maurus* for it.

In this paper we consider both *Plebejides* SAUTER, 1968 and *Maurus* BÁLINT, 1991 as subgenera of *Plebejus* KLUK, 1802, the former with two species: *Plebejus martini* (ALLARD, 1867) and *Plebejus allardi* (OBERTHÜR, 1874) and the second with only one species: *Plebejus vogelii* (OBERTHÜR,

1920).

Systematic part

1. Subgenus *Plebejides* SAUTER, 1968

Original description: *Mitt. ent. Ges. Basel* **18**: 4.

Type species: *Lycaena pylaon* FISCHER VON WALDHEIM, 1832 (sensu lato), by original designation. This taxon is currently regarded as consisting of several different species. The genitalia of the specimen figured by SAUTER, clearly place it under *Plebejus trappi* VERITY, 1927.

1.1. *Plebejus (Plebejides) martini* (ALLARD, 1867)

Original combination: *Lycaena Martini* ALLARD, 1867, *Annls. Soc. ent. Fr.* (4) **7**: 311-322, pl. 6, f. 2a-b (female). [on p. 314 the species name is spelt *Martinii*, an incorrect original spelling; on p. 319, the actual description, the species name is spelt *Martini*].

Type locality: Algeria, Prov. Constantine, Lambessa.

Type series: 10 or 12 females. The private collection of G. ALLARD, consisting of Coleoptera and Lepidoptera from Europe and the Mediterranean, was deposited in the Institut Pasteur, Paris (HORN & KAHLE 1935: 3). However, according to the Director of this Institute (i.l.) and to Dr. J. PIERRE (MNHP, i.l.) the collection of ALLARD was never present in the Institut Pasteur. The collection should be considered lost, probably even destroyed. Here, we designate a male specimen in the BMNH with the following labels as the neotype: «Lambessa, R. Oberthür 1875; Ex Oberthür coll., Brit. Mus. 1927-3; Neotypus, *L. martini*, des. DE PRINS, VAN DER POORTEN & BÁLINT, III. 1992» (see fig. 1).

Nomenclature:

Cupido Martini (ALLARD, 1867); in KIRBY 1871, A synonymic catalogue of the diurnal Lepidoptera, p. 372.

Lycaena Zephyrus ? v. ? *Martini* ALLARD, 1867; in STAUDINGER, 1871, in STAUDINGER & WOCKE, Catalogus der Lepidopteren des Europäeischen Faunengebietes, p. 10.

Lycaena Martinii ALLARD, 1867; in OBERTHÜR 1874, *Petites Nouv. Ent.* **1**: 413.

Lycaena Martini ALLARD, 1867; in OBERTHÜR 1876, *Ét. Ent.* **1**: 22, pl. 1, f. 1 (male); COURVOISIER 1914, *Dt. ent. Z. Iris* **28**: 205 (*martinii*).

Lycaena Martini ALLARD, 1867; in RÜHL & HEYNE 1895, Die palaearktischen Gross-Schmetterlinge und ihre Naturgeschichte, p. 246; STAUDINGER 1901, in STAUDINGER & REBEL, Catalog der Lepidopteren des Palaearktischen Faunengebietes, p. 79; SEITZ 1909, Die Gross-Schmetterlinge der Erde, p. 303, pl. 78k (male); OBERTHÜR 1910, *Ét. Léop. comp.* **4**: 220-225; STAUDER 1914, *Z. wiss. Insekt Biol.* **10**: 169, f. 5 (*martini*); OBERTHÜR 1915, *Ét. Léop. comp.* **10**: 377-378, 440, pl. CCLXXXIX f. 2356 (male), f. 2357 (female), pl. CCXC, f. 2358 (female), pl. XXXII, f. 4510 (larva); ROTHSCHILD 1925b, *Nov. Zool.* **32**: 212 (*martini*).

Lycaena (Plebejus) martini martini ALLARD, 1867; in FORSTER 1938a, *Ent. Rdsch.* **55**: 417-419, pl. 3, f. b3 (male), b4 (female), pl. 4, f. b3 (male), b4 (female).

Polyommatus (Plebejus) martini (ALLARD, 1867); in FORSTER 1938b, *Mitt. münch. ent. Ges.* **28**: 112.

Plebejus martini (ALLARD, 1867); in BEURET 1961, *Mitt. ent. Ges. Basel* 1961: 318, pl. 18, f. 34 (male), f. 35 (female); SAUTER 1968, *Mitt. ent. Ges. Basel* **18**: 4; HIGGINS 1975, The Classification of European Butterflies, p. 141, f. 174 (male genitalia, incomplete); SCHUURMANS 1976, *Phegea* **4**: 51; BRIDGES 1988, Catalogue of Lycaenidae & Riodinidae, p. 216; BOZANO & GIACOMAZZO 1988, *Nota lepidopterologica* **11**: 83; DE FREINA 1989, *Entomofauna* **10**: 91; BÁLINT & KERTÉSZ 1990, *Linneana Belgica* **12**: 193; DEVARENNE 1990, *Alexanor* **16** (1989): 151.

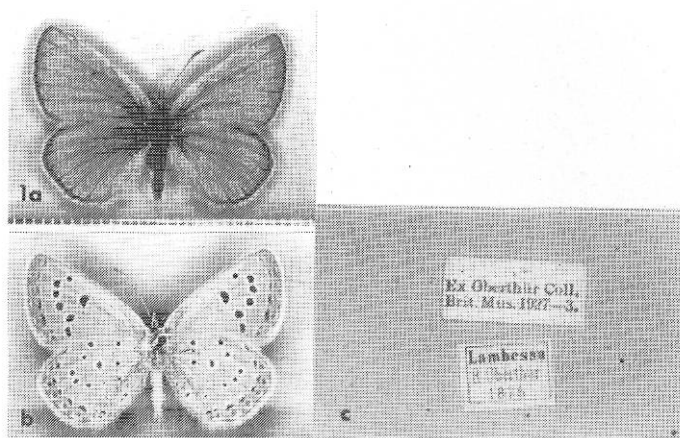


Fig. 1: *Lycaena martini* ALLARD, 1867, neotype male, coll. BMNH; a. upperside, b. underside, c. labels (Photo C. SMITH).

Plebejus martini martini (ALLARD, 1867); in HIGGINS & RILEY 1970, *A Field Guide to the Butterflies of Britain and Europe*, p. 274, pl. 4, f. 4a (female) and pl. 55, f. 12 (male); HIGGINS & HARGREAVES 1983, *The Butterflies of Britain and Europe*, p. 77, f. male and female.

Plebejides martini (ALLARD, 1867); in SAUTER 1968, *Mitt.ent. Ges. Basel*, N.F. 18: 4.

Plebejus (Plebejides) martini (ALLARD, 1867); in BÁLINT 1990, *A Janus Pann. Múz. Évkönyve* 35: 42; BÁLINT 1991, *Linneana Belgica* 13: 64.

Comparison of nominotypical material, including type specimens of *Lycaena martini* ALLARD, 1867 and *Lycaena allardi ungemachi* ROTHSCHILD, 1925 showed no differences in external features (see figs 1-3, also compare figs 4-6 with figs 7-12). Also male and female genitalia are identical. There is no gap in the distribution from East Algeria westwards to well into the Atlas mountains (see fig. 33). In his original description ROTHSCHILD (1925) compared the Moroccan specimens with the geographically close populations of *allardi* and not with the further eastern populations of *martini*, although the characters given coincide completely with this latter taxon. Therefore, we consider *Lycaena allardi ungemachi* ROTHSCHILD, 1925 as mere synonym of *Plebejus martini* (ALLARD, 1867).

Synonym :

Lycaena allardi ungemachi ROTHSCHILD, 1925, *Bull. Soc. Sci. nat. Maroc* 5: 333, nr. 46, nov. syn.

Type locality: Morocco, Great Atlas, Aselda (Reraya Valley), 1500-2000 m.

Type series : 24 males, 16 females [mentioned in the original description], lectotype, male, Morocco, with labels «Aghbalu Larbi, Middle Atlas, 2100 m, 5.VI.25, (Hartert & Young); Rothschild Bequest, B.M. 1939-I.; Type, *L. allardi ungemachi* Roths.; Syntype, *Lycaena allardi ungemachi* Rothschild, det. P. Ackery 1989; Lectotypus, *L. allardi ungemachi*, des. Zs. Bálint, 10.VII.1991.» (see figs 2a-c). Paralectotypes: 12 males and 3 females with same locality labels, without the label of Mr. ACKERY, all in coll. BMNH (see figs 3a-c).

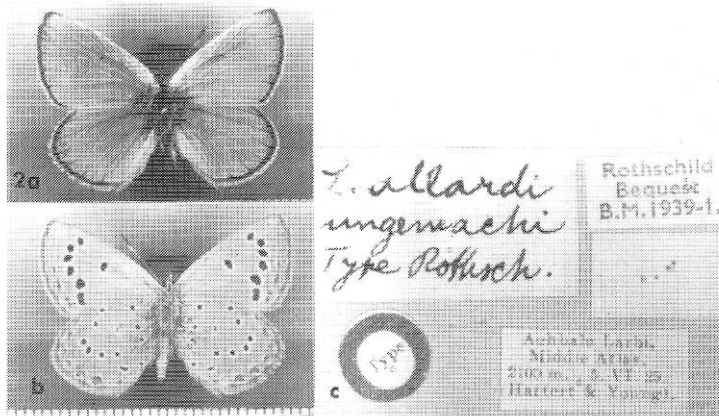


Fig. 2: *Lycaena allardi ungemachi* ROTHSCHILD, 1925, lectotype male, coll. BMNH; a. upperside, b. underside, c. labels (Photo Ph. ACKERY).

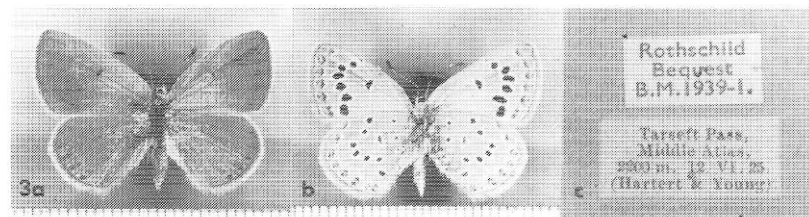


Fig. 3: *Lycaena allardi ungemachi* ROTHSCHILD, 1925, paralectotype female, coll. BMNH; a. upperside, b. underside, c. labels (Photo Ph. ACKERY).

Nomenclature:

- Lycaena allardi ungemachi* ROTHSCHILD, 1925; in BANG-HAAS 1927, *Novitates Macrolepidopterologicae* 2: 81; BOLLOW 1930, in SEITZ 1929-1939, *Les Macrolépidoptères du Globe, Diurnes Paléarctiques supplément*, p. 264; ROTHSCHILD 1931, *Nov. Zool.* 36: 198.
- Lycaena (Plebeius) allardi ungemachi* ROTHSCHILD, 1925; in REISSER 1933, *Eos* 9: 91.
- Plebeius Allardi Ungemachi* ROTHSCHILD, 1925; in ZERNY 1935, *Mem. Soc. Sci. nat. Phys. Maroc* 42: 39.
- Lycaena (Plebeius) martini ungemachi* ROTHSCHILD, 1925; in FORSTER 1938a, *Ent. Rdsch.* 55: 418-419, pl. 3, f. b5 (male), c1 (male), c2 (female), pl. 4, f. b5 (male), c1 (male), c2 (female).
- Plebeius martini ungemachi* (ROTHSCHILD, 1925); in RUNGS 1981, *Trav. Inst. scient., Série Zool. Rabat* 40: 454; MOKHLES 1984, *Nota lepidopterologica* 7: 260; BARRAGUÉ 1987, *Linneana Belgica* 11: 4; BRIDGES 1988, *Catalogue of Lycaenidae & Riodinidae*, p. 359; BÁLINT & KERTÉSZ 1990, *Linneana Belgica* 12: 193.

Material of *Plebejus martini* (ALLARD, 1867) examined
(Total: 516 specimens)

Abbreviations of collections:

GCB	=	G. C. BOZANO (Milano)
BMNH	=	British Museum (Natural History) (London) (now: The Natural History Museum)
HAC	=	H. A. COENE (Hoorn, the Netherlands)
FC	=	F. COENEN (Brussels)
DF	=	J. J. DE FREINA (München)
WDP	=	W. O. DE PRINS (Antwerpen)
HNHM	=	Hungarian Natural History Museum (Budapest)
JH	=	J. HUTSEBAUT (Brussels)
ITZA	=	Instituut voor Taxonomische Zoölogie (Zoölogisch Museum) (Amsterdam)
JMM	=	J. M. MAIRIAUX (Brussels)
MNHP	=	Muséum national d'histoire naturelle (Paris)
NNML	=	Nationaal Natuurhistorisch Museum (Leiden)
NHMW	=	Naturhistorisches Museum (Wien)
DVDP	=	D. VANDER POORTEN (Antwerpen)
AR	=	A. RIEMIS (Turnhout)
ZW	=	Z. WEIDENHOFFER (Praha)
ZMUC	=	Zoologisk Museum (Copenhagen)

Other abbreviations:

m	=	male
f	=	female

Most geographical names are spelt according to the 7th edition of The Times Atlas of the World, and in brackets we include the geographical coordinates for the places we could find in The Times Atlas or in RUNGS (1981).

Morocco:

-Great Atlas: Asselda, Reraya Valley [31.15N 7.55W], 1500m, 17.V.1925, 1f, HARTERT & YOUNG (BMNH); Reraya, 2.IV.1950, 1m, no collector (MNHP); Tizi-n-Talrhemt [32.35N 4.29W], 1900-1950m, 22/23.V.1981, 1m, W. L. BLOM (NNML).

-Middle Atlas: Aghbalu Larbi [33.08N 4.55W], 2100m, 5.VI.1925, 13m + 3f, HARTERT & YOUNG (BMNH); Tarseft Pass [= Taghzeft], 2200m, 6-11.VI.1925, 10m + 9f, HARTERT & YOUNG (BMNH); Aguelman Sidi Ali ou Mohammed [33.04N 5.00W], 6500 ft, 20-21.VI.1936, 1m, no collector (BMNH); Tizi n' Tkrine, Djebel Ahmar, 1700m, 3-10 and 21.VI.1928, 3m + 4f, mission F. LE CERF (MNHP); idem 1m + 1f in HNHM; Tizi n' Boufténe, 2300m, 5.VI.1928, 1m + 1f, no collector (MNHP); Casrah des Igrezranet Cruder, no date, 1f, O. TAFFERT (MNHP); Col du Zad, 2100m, 28.V.1986, 2m, JH (JH); 5.VI.1973, 2m + 1f, JMM (JMM); 5.VI.1979, 1m, HAC (HAC); 5.VI.1987, 1f, JPB (JPB); 30.V.1987, 1m, JPB (JPB); Boulemane [33.22N 4.45W], 1800m, V.1983, 2m, MOKHLES (HAC); Takaltount, Massif du Kandar, 1500m, 17/18.V.1982, 24m + 10f, JMM (JMM); Annoceur [33.40N 4.51W], 3.V.1935, 1m, R. E. ELLISON (MNHP); idem, 1m (ITZA); 15.V.1985, 7m + 10f, JPB (JPB); 16.V.1985, 5m + 4f, JPB (JPB); Timhadit [33.15N 5.09W], 6600 ft, 22-27.V.1949, 1f, C. WYATT (ZW); Itzer [32.54N 5.03W], 23.IV.1929, 1m, no collector (MNHP); Daya Chikker [34.07N 4.10W], 3.V.1929, 1m, no collector (MNHP).

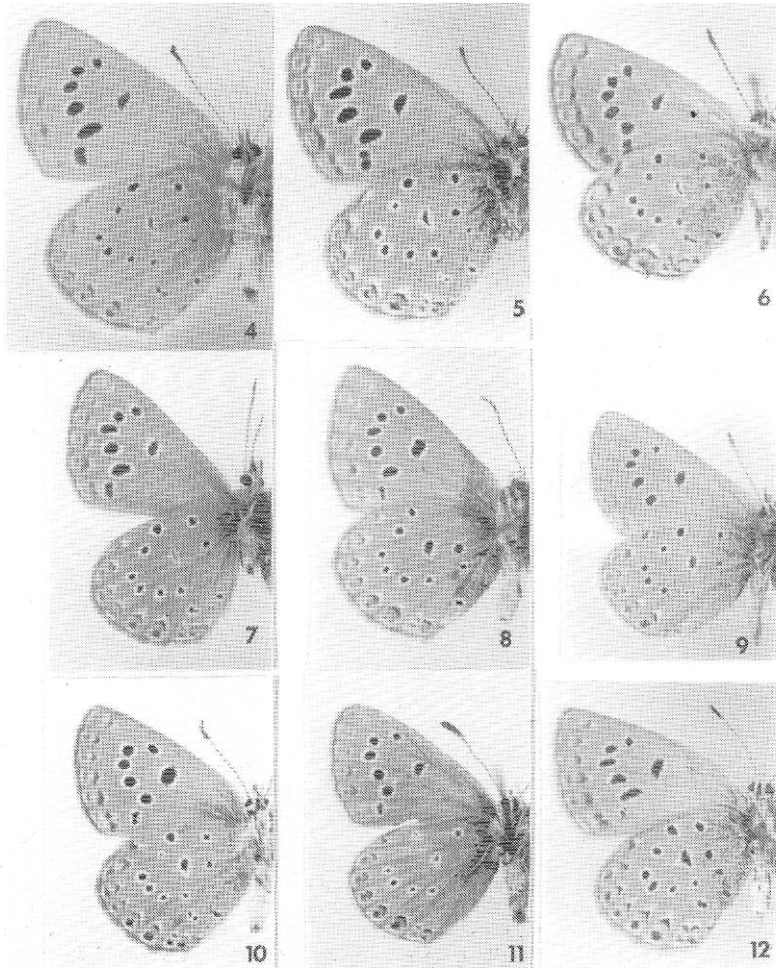
-35m + 29f, from several localities in Middle-Atlas: Tizi n' Boufténe, Djebel Ahmar, Casrah des Igrezranet (MNHP).

Algeria

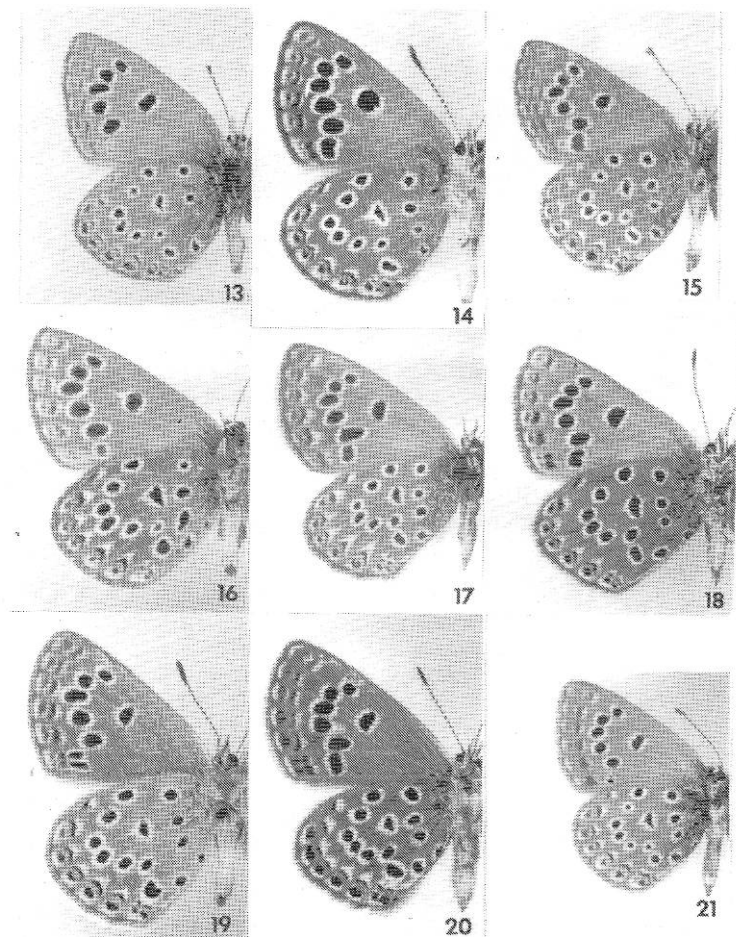
-West Algeria (Prov. Oran): Oran littoral [35.45N 0.38W], Eckmuhl, 100-200m, 14.III.1972, 1m, O. & K. SLABÝ (ZW); 3.V.1972, 1m, O. SLABÝ (ZW); Tlemcen Mts. [34.35N 1.21W], 1-10.VI.1973, 1m, O. & K. SLABÝ (AR).

-Central Algeria (Prov. Algiers): Environs d'Algir [36.50N 3.00E], 3m + 2f, Capt. HALL (BMNH); Algiers, no date, 2m, M. BARTEL (ITZA).

-East Algeria (Prov. Constantine): Kabylia, Tizi-n-Tourlral, VII.1987, 2f, JH (JH); Khenchela [35.22N 7.09E], V.1908, 2m + 2f, H. POWELL (ITZA); Lambessa, 1875, 1m, R. OBERTHÜR (BMNH); VI.1910, 1f, G. BUKOVSKI (ITZA); V.1912, 20m + 8f, H. POWELL (BMNH); V-VI.1913, 16m + 20f, H.



Figs 4-12: *Plebejus (Plebejides) martini* (ALLARD, 1867): right wing's underside; 4. Morocco, Middle Atlas, Massif du Kandar, 1500m, 17.V.1972, male, JMM; 5. Morocco, Middle Atlas, Col du Zad, 2100m, 28.V.1986, male, JH; 6. Morocco, Middle Atlas, Timhadit, 6600 ft., 27.V.1949, female, C. WYATT (coll. ZW); 7. Algeria occ. Tlemcen mts., 1-10.VI.1973, male, O. & K. SLABÝ (coll. AR); 8. Algeria occ., Oran littoral, 100-200m, Eckmuhl, 14.III.1972, male, O. & K. SLABÝ (coll. ZW); 9. Algeria, env. Algiers, no date, male, M. BARTEL (coll. ITZA); 10. Algeria, Aurès mts., Djebel Ahmar-Khaddou, 1000-1200m, 5-6.V.1986, male, DF; 11. Algeria, Hammam R'hira, 25.V.1908, male, H.C. NISSEN (coll. ZMUC); 12. Algeria, Constantine, Khenchela, V.1908, female, H. POWELL (coll. ITZA) (slightly enlarged) (Photo W. DE PRINS).



Figs 13-21: *Plebejus (Plebejides) allardi* (OBERTHÜR, 1874) right wing's underside: 13. Morocco, Anti-Atlas, Tafraoute, 1400m, 16.IV.1987, male, GCB; 14. Morocco, Anti-Atlas, Col de Kerdous, 1300-1400m, 13.IV.1989, male, DF; 15. Morocco, Marrakech, 20.V.1934, male, coll. NNML; 16. Algeria, prov. Oran, Seb dou, 10.VI.1970, male, O. & K. SLABÝ (coll. JH); 17. Algeria, prov. Algiers, Algiers, 1887, male, coll. ITZA; 18. Algeria, prov. Algiers, Guelt-es-Stel, 3.V.1913, female, H.C. NISSEN (coll. ZMUC); 19. Tunisia, Jerba, env. Houmt-Soukh, 14.IV.1989, male, DVDP; 20. idem, female, DVDP; 21. Libya, Tripolitania, env. Tarabulus, 0-100m, 28.III.1977, female, G. KRUSEMAN (coll. ITZA) (slightly enlarged) (Photo W. DE PRINS).

POWELL (BMNH); VI.1884, 5m, J. MERKL (BMNH); no date, 1m, no collector (MNHP); V.1885, 1m, no collector (MNHP); 19-25.V.1932, 8m + 8f, H. STAUDER (HNHM); Marcouna près Batna [35.34N 6.10E], 26.V.1969, 1m, O. & K. SLABÝ (ZW); Pic des Cèdres, Batna, 18.V.1937, 7m + 2f, no collector (MNHP); Mts. du Hodna [35.50N 4.50E], 24.VI.1972, 1m, J.-C. WEISS (ZW); 10km NW Ain Azel [35.46N 5.33E], 1000m, 3.V.1986, 1m + 1f, DF (DF); Aurès-Gebirge, Djebel Ahmar-Khadou, 4km NNE Ain El Beida, 1000-1200m, 5-6.V.1986, 2m, DF (DF); Aurès-Gebirge, Djebel Ahmar-Khadou, 10km NW Ain El Beida, 1400m, 6.V.1986, 1m, DF (DF); Aurès-Gebirge, Djebel Ahmar-Khadou, El Madher, 1100m, 28.IV-6.V.1986, 1m, DF (DF); Sorgens-Maufa, Aurès occidental, 28.IV, 1m + 1f, no collector (MNHP).
 -68m + 35f, from different localities : Khenchela (prov. Constantine), Djebel Aurès Balou, Titouguel (région Djebel Aurès), Tifrit NE of Saïda, Lambessa, Batna (BMNH).
 -11m + 5f, from different localities : Lambessa, Khenchela, C.d.Chênes, V (MNHP).
 ?-Condorcet, 24-28.V.1938, 20m + 5f, no collector (MNHP); Algérie, 23-27.V.1938, 13m + 5f, V. DURUY (MNHP); Tala-Rana, 5.VII.1918, 1m, H.C. NISSEN (ZMUC); Lella Kredidja, E. au Fonsou, 3.VII.1907, 1f, H.C. NISSEN (ZMUC); Lella Kredidja, no date, 1m, H.C. NISSEN (ZMUC); Hammam Righi, 11.V.1955, 1m, no collector (MNHP); Hammam R'hira, 25.V.1913, 1m + 1f, W.R. & E.H. (BMNH); idem, 1m, H.C. NISSEN (ZMUC); Rovigo, no date, 12m + 6f, no collector (BMNH); Mauritania, 1m, H.C. NISSEN (ZMUC).
 Without data: 1m + 1f, coll. SNELLEN (NNML); Korb02, 1m + 1f (ZW); 1m, H.C. NISSEN (ZMUC).

1.2. *Plebejus (Plebejides) allardi* (OBERTHÜR, 1874) stat. rev.

Original combination: *Lycoena Allardii* OBERTHÜR, 1874, *Petites Nouv.Ent.* 1: 412-413.

Type locality: Algeria, prov. Oran, Seb Dou.

Type series: 2 males [mentioned in original description]; lectotype, male, Algeria, «Seb Dou 268, 2-5-81; Seb Dou (Oran), Dr. Codet, 1880-1882; Ex Oberthür Coll., Brit.Mus. 1927-3; Lectotypus, *L. allardi*, des Zs. Bálint, 10.VII.1991», in coll. BMNH (figs 22a-c). Paralectotype, female, Algeria, «Seb Dou 248, 2-5-81; Seb Dou (Oran), Dr. Codet, 1880-1882; Ex Oberthür Coll., Brit.Mus., 1927-3; *Lycaena Allardii* Obtr. o., Etud. d'Ent. IXe liv., pl. 16 - (modele de m. d'apreval); Paralectotypus, *L. allardi*, des. by Zs. Bálint, 10.VII.1991», in coll. BMNH (figs 23a-c).

Nomenclature

Lycaena Allardii OBERTHÜR, 1874; in OBERTHÜR 1876, *Ét.Ent.* 1: 22, pl. 1, f. 2a-b (male); STAUDINGER 1901, in STAUDINGER & REBEL, Catalog der Lepidopteren des Palaearctischen Faunengebietes, p. 79; SEITZ 1909, Die Gross-Schmetterlinge der Welt I. Die Palaearktische Gross-Schmetterlinge 1. Tagfalter, p. 303, pl. 78i (female); COURVOISIER 1914, *Dt.ent.Z.Iris* 28: 157 (*allardii*).

Lycaena Allardi OBERTHÜR, 1874; in OBERTHÜR 1884, *Et.ent.* 9: 35, pl. 3, f. 16 (female); OBERTHÜR 1910, *Et.lép.comp.* 4: 225-226; OBERTHÜR 1915, *Et.lép.comp.* 10: 378, pl. CCLXXIX, f. 2353 (male), 2354-2355 (female); OBERTHÜR 1922, *Et.lép.comp.* 19: 103-104 [misidentification, recte *Plebejus martini*]; STETTER-STÄTTERMAYER 1937, *Ent.Rdsch.* 54: 518.

Lycaena (Plebeius) martini allardi OBERTHÜR, 1874; in FORSTER 1938a, *Ent.Rdsch.* 55: 418, pl. 3, f. c3 (male), c4 (female), pl. 4, f. c3 (male), c4 (female).

Plebejus martini allardi (OBERTHÜR, 1874); in HIGGINS & RILEY 1970, A Field Guide to the Butterflies of Britain and Europe, p. 275, pl. 4, f. 4b (female); HIGGINS & HARGREAVES 1983, The Butterflies of Britain and Europe, p. 77, f. female; BARRAGUÉ 1987, *Linneana Belgica* 11: 4; BÁLINT & KERTÉSZ 1990, *Linneana Belgica* 12: 193.

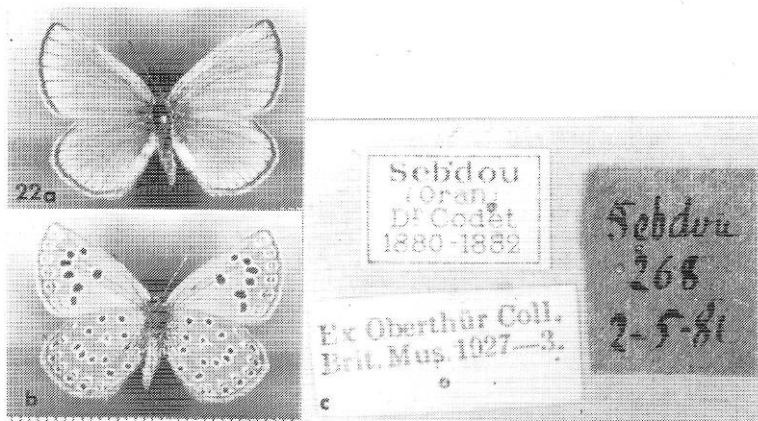


Fig. 22: *Lycaena allardi* OBERTHÜR, 1874, lectotype male; a. upperside, b. underside, c. labels (Photo Ph. ACKERY).

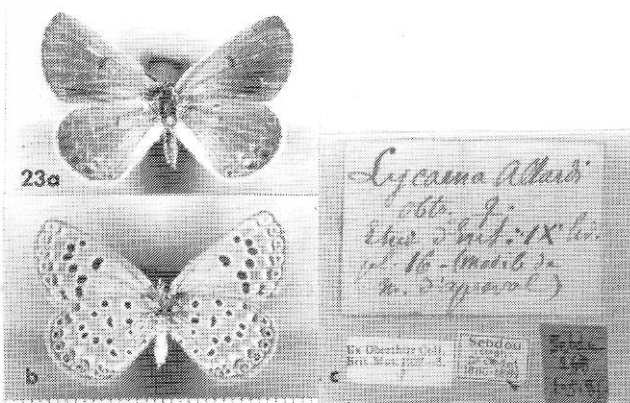


Fig. 23: *Lycaena allardi* OBERTHÜR, 1874, paralectotype female; a. upperside, b. underside, c. labels (Photo Ph. ACKERY).

Material of *Plebejus allardi* (OBERTHÜR, 1874) examined (Total: 183 specimens)

Morocco

- Anti-Atlas: Tizi-n-Tarakatine, 1500m, 4.V.1989, 1m, HAC (HAC); Ait-Abdallah, Tafraoute [29.40N 8.58W], 1400m, 4m + 2f, GCB (GCB); Col de Kerdous [ca. 45 km SE Tiznit], SE-Seite, 1300-1400m, 13.IV.1989, 3m + 1f, DF (DF).
- Mogador [=Essaouira] [31.30N 9.48W], 20.V.1934, 1f, no collector (MNHP).
- Marrakech [31.49N 8.00W], 20.V.1934, 1m + 1f, no collector (NNML).
- Meknes [33.53N 5.37W], 20.V.1934, 1m, no collector (NNML).

Algeria

- Prov. Oran: Sebdou [34.37N 1.21W], 900m, 2.V.1881, 4m + 1f, Dr. Codet (BMNH); V.1907,

Plate 1



Figs. 1-6: *Plebejus (Plebejides) martini* (ALLARD, 1867), 1-3 males, 4-6 females; Figs. 7-16: *Plebejus (Plebejides) allardi* (OBERTHÜR, 1879), 7-12 males, 13-16 females; Figs. 17-18: *Plebejus (Maurus) vogelii* (OBERTHÜR, 1920), 17 male, 18 female.

Plate 2



Same specimens as in plate 1, underside.

7m + 2f, H. POWELL (BMNH); Peck 1880, 1m, ELWES coll. (BMNH); V.1907, 1m, H. POWELL (NNML); V. 1907, 1m, H. POWELL (ITZA); V.1930, 1m + 1f, J. STÄTTERMAYER (HNHM); 10.VI.1970, 2m, O. SLABÝ (JH); 12.V.1972, 1f, O. & K. SLABÝ (AR); 10/20.V.1974, 1m, O. & K. SLABÝ (ITZA); 16.V.1974, 1m, O. & K. SLABÝ (ITZA); 2.V.1972, 4m + 3f, O. & K. SLABÝ (ZW); 15.IV.1974, 1m, O. & K. SLABÝ (ZW); 12.V.1972, 4m + 2f, O. & K. SLABÝ (ZW); 15.V.1972, 1m + 2f, O. SLABÝ (ZW); 16.V.1974, 1m, O. & K. SLABÝ (HAC); 10-20.V.1974, 1m, O. & K. SLABÝ (HAC); no date, 3m, no collector (NHMW); no date, 1m + 1f, no collector (MNHP); Aflou (Sud-Oranais) [34.08N 2.03W], VI.1911, 1m, H. POWELL (BMNH).

-Prov. Algiers: Algiers [36.05N 3.00E], 1887, 1m + 1f, no collector (ITZA); Guelt-es-Stel [35.10N 3.02E], 21.IV.1912, 3m + 2f, W.R. & K.J. (BMNH); 17.IV.1913, 1m, V. FAROULT (BMNH); 23.IV.1913, 4m, V. FAROULT (BMNH); 25.IV.1913, 1m, V. FAROULT (BMNH); 27.IV.1913, 1m + 1f, V. FAROULT (BMNH); 1.V.1913, 1m, V. FAROULT (BMNH); 2.V.1913, 1m + 1f, V. FAROULT (BMNH); 3.V.1913, 1m + 1f, V. FAROULT (BMNH); 4.V.1913, 2m + 2f, V. FAROULT (BMNH); 9.V.1913, 3m + 1f, V. FAROULT (BMNH); 10.V.1913, 1f, V. FAROULT (BMNH); 12.V.1913, 1f, V. FAROULT (BMNH); 17.V.1913, 1m + 2f, V. FAROULT (BMNH); 22.IV.1912, 1f, H.C. NISSEN (ZMUC); 3.V.1913, 1m + 1f, H.C. NISSEN (ZMUC); 30.IV.1912, 1m, H.C. NISSEN (ZMUC); Guelt-es-Stel, Djelfa [34.43N 3.14E], 10.V.1913, 1m, V. FAROULT (BMNH); 17.V.1913, 2m, V. FAROULT (BMNH); V.1934, 3m + 4f, no collector (MNHP); IV.1937, 3m + 2f, no collector (MNHP); Puits Baba 18 km SE of Guelt-es-Stel, 19.V.1913, 1m + 4f, V. FAROULT (BMNH); Aïn Oussera [35.24N 2.54E], SE of Boghara, 6.V.1913, 1m, V. FAROULT (BMNH).

?-Hassi-Bahch, VIII.1934, 1m, no collector (NNML); no date, 3m + 3f, no collector (MNHP).

Tunisia

-Jerba: env. Houmt-Souk [33.55N 10.52E], 14/15.IV.1989, 7m + 7f, DVDP (DVDP); 10-12.IV.1990, 15m + 5f (62m + 36f were observed) FC, WDP & DVDP (FC, WDP, DVDP); Gellala, 24-25.V.1990, 3m + 2f, B. MOLLET.

Libya

-Tripolitania: Gharyan [32.10N 13.01E], 24.III.1951, 1m, K.M. GUICHARD (BMNH); Garian Hills, 30.III.1952, 1m + 1f, K.M. GUICHARD (BMNH); Env. Tarabulus [=Tripoli] [32.54N 13.11E], Qasr Aswad, 0-100m, 18.III.1977, 3m, G. KRUSEMAN (ITZA); 28.III.1977, 4m + 4f, G. KRUSEMAN (ITZA).

Legend of colour plates 1 and 2 :

Figs 1-2, 4-6: *Plebejus martini* (ALLARD, 1867)

1. male, Maroc, Col du Zad, 2150m, 30.V.1987, J.-P. BORIE leg.; 2. male, Maroc, Annoceur, 15.V.1985, J.-P. BORIE leg.; 4. female, Maroc, Annoceur, 17.V.1985, J.-P. BORIE leg.; 5. female, Maroc, Annoceur, 16.V.1985, J.-P. BORIE leg.; 6. female, Algeria, Lambessa, VI.1910, BUKOVSKI leg.

Figs 3, 7-16 : *Plebejus allardi* (OBERTHÜR, 1874) :

3. male, Marocco, Anti Atlante, Tafraoute, Ait-Abdallah, 1400m, 16.IV.1987, G.C. BOZANO leg.; 7. male, Tunisia, Jerba, env. Houmt-Soukh, 14.IV.1989, D. VAN DER POORTEN leg.; 8. male, Tunisia, Jerba, env. Houmt-Soukh, 14-15.IV.1989, D. VANDER POORTEN leg.; 9. idem; 10. male, Algeria occ., Sebdu, 900m, 10-20.V.1974, O. & K. SLABÝ leg.; 11. male, Algeria occ., Sebdu, 900m, 16.V.1974, O. & K. SLABÝ leg.; 12. male, Libya, Tripolitania, env. Tripoli, Qasr Aswad, 0-100m, 18.III.1977, G. KRUSEMAN leg.; 13. female, Tunisia, Jerba, env. Houmt-Soukh, 10-12.IV.1990, F. COENEN, D. VANDER POORTEN & W. DE PRINS leg.; 14. female, Algeria, Algier, 1887, coll. ITZA; 15. female, Libya, Tripolitania, env. Tripoli, Qasr Aswad, 0-100m, 28.III.1977, G. KRUSEMAN leg.; 16. female, Tunisia, Jerba, env. Houmt-Soukh, 14.IV.1989, D. VAN DER POORTEN leg.

Figs 17-18 : *Plebejus vogelii* (OBERTHÜR, 1920) :

17. male, Maroc, Col du Taghzeft, 2000m, 8.IX.1986, J.-P. BORIE leg.; 18. female, Maroc, Col du Taghzeft, 1900m, 29.VIII.1990, J.-P. BORIE leg.

(Please correct the name of fig. 3 under plate 1 and 2; it should read: *Plebejus allardi* (OBERTHÜR, 1874).

The taxa *martini* and *allardi* constantly differ in superficial characters and genitalia.

Superficial characters (see colour plates and compare figs 4-12 with figs 13-21).

Male: upperside in *allardi* a little more violet blue than in *martini* and veins more clearly visible towards margin in *allardi*. In most specimens marginal spots on hindwing better developed in *allardi*. Underside pattern visible through wing surface in *allardi*. Underside all black spots better developed in *allardi*, more broadly white ringed. On forewing postdiscal dot in cell 4 touching marginal lunules in *allardi*. On hindwing basal spots very well developed in *allardi*, weak or partially absent in *martini*. In particular basal dot in cell 1c always present and well developed in *allardi*, very strongly reduced but mostly absent in *martini*. White arrows proximal to marginal lunules better developed in *allardi* than in *martini*, sometimes touching the white rings of the postdiscal dots. Distance between postdiscal dots and marginal lunules greater in *martini*.

Female: upperside forewing orange marginal lunules present in most specimens of *allardi*, absent in all studied material of *martini*. Hindwing orange marginal lunules better developed in *allardi*, basad of these lunules some blue patches in *allardi*. Underside same differences as in male.

Male genitalia (figs 24-25): falces more slender in *martini*, furca wider in *martini* and slender, without basal lobe as in *allardi*. Valvae in *martini* reaching its broadest width just beyond middle, in *allardi* much more to the distal end.

Female genitalia (figs 26-27): in *martini* apophyses anteriores longer and more slender, in *allardi* two extra, weakly sclerotized plates beside antrum.

In some places both taxa occur together, apparently without interbreeding, e.g. the neighbourhood of Algiers city, region of Tlemcen-Sebdou in West Algeria.

Morphological differences and sympatric occurrence in some places lead to the conclusion that the two taxa are not conspecific.

2. Subgenus *Maurus* BÁLINT, 1991

Original description: *A Janus Pannonius Múzeum Évkönyve* 35(1990): 39.

Type species: *Lycaena vogelii* OBERTHÜR, 1920, by original designation.

2.1. *Plebejus (Maurus) vogelii* (OBERTHÜR, 1920)

Original combination: *Lycaena Vogelii* OBERTHÜR, 1920, *Et. Lép. comp.* 17 : 55.

Type locality: Morocco, Middle Atlas, Taghzeft Pass.

Type series: exact number not mentioned in description, but certainly more than 20 specimens; lectotype, male, «Maroc, Moyen-Atlas, Col du Taghzeft, 17 Août 1920, Harold Powell; Ex Oberthür coll., Brit. Mus. 1927-3; *Lycaena Vogelii*, male, Obth., Pl. DXXX, fig. 4399; Lectotypus *Lycaena vogelii*, des. Zs. Bálint, 10. VII. 1991», in coll. BMNH (figs 28a-c). Paralectotypes: 3 males

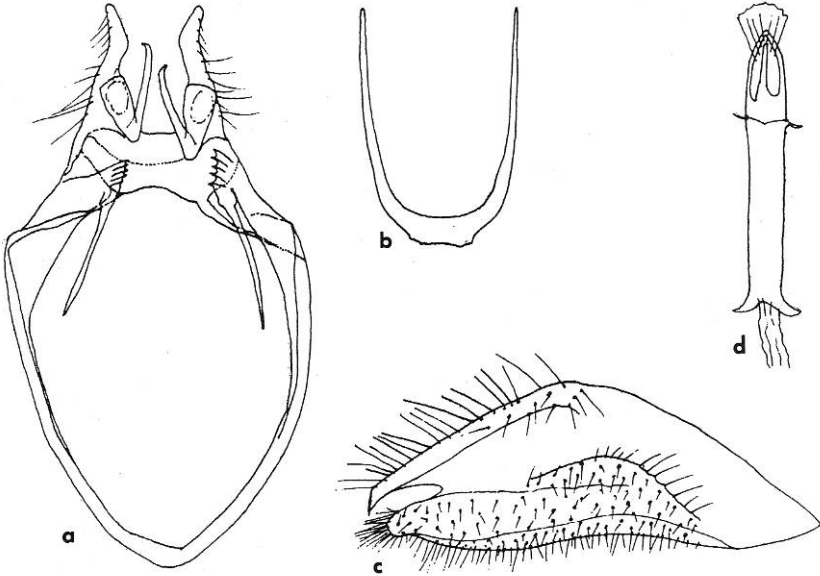


Fig. 24: *Plebejus (Plebejides) martini* (ALLARD, 1867), male genitalia, Morocco, Middle Atlas, Massif du Kandar, Takaltount, 17.V.1982, JMM leg. [prep. WDP 2887], a. Uncus, tegumen and vinculum, b. furca, c. left valva, d. aedeagus.

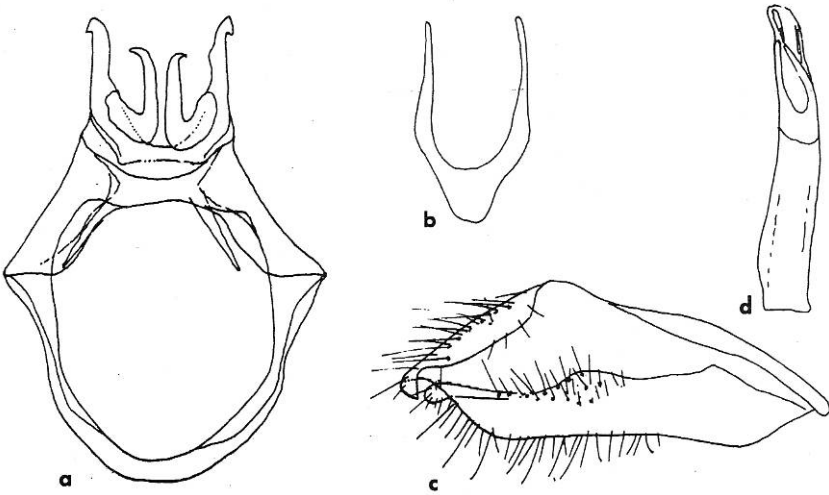


Fig. 25: *Plebejus (Plebejides) allardi* (OBERTHÜR, 1874), male genitalia, Morocco, Marrakech, 20.V.1934, in coll. NNML [WDP 2986], a. Uncus, tegumen and vinculum, b. furca, c. left valva, d. aedeagus.

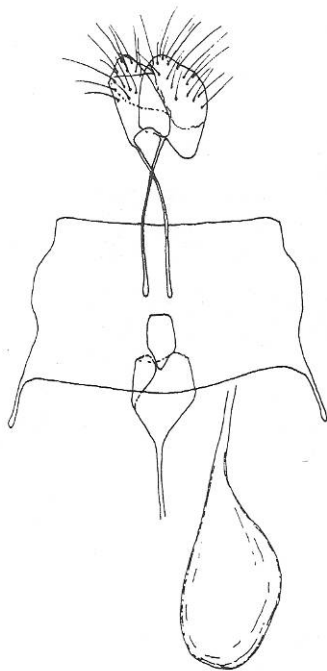


Fig. 26: *Plebejus (Plebejides) martini* (ALLARD, 1867), female genitalia, Algeria, prov. Constantine, Khenchela, V.1908, H. POWELL leg. [prep. WDP 2908].

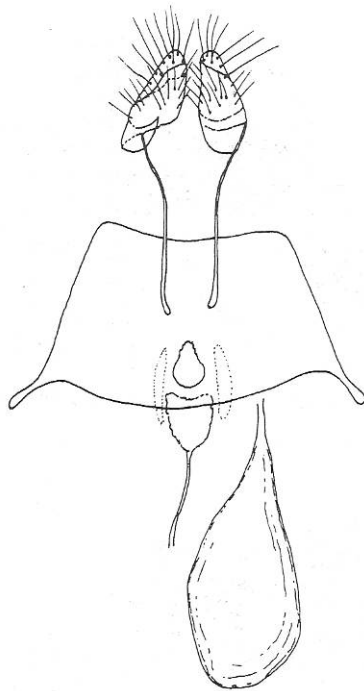


Fig. 27: *Plebejus (Plebejides) allardi* (OBERTHÜR, 1874), female genitalia, Tunisia, Jerba, env. Houmt-Soukh, 14.IV.1981, DVDP leg. [prep. WDP 2906].

and 2 females, Morocco, Middle Atlas, 17.VIII.1920, Harold POWELL, all in coll. BMNH (figs 29a-c).

Nomenclature

Lycaena Vogelii OBERTHÜR, 1920; in BANG-HAAS 1926, *Novitates Macrolepidopterologicae* 1: 93. *Lycaena argyrognomon vogelii* OBERTHÜR, 1920; in BOLLOW 1930, in SEITZ, *Die Gross-Schmetterlinge der Erde, Supplement 1*, p. 262.

Polyommatus (Plebeius) vogelii (OBERTHÜR, 1920); in FORSTER 1938b, *Mitt.munch.ent.Ges.* 28 : 112.

Plebejus vogelii (OBERTHÜR, 1920); in STEMPFFER 1937, *Bull.Soc.ent.Fr.* 15: 296; BEURET 1961, *Mitt.ent.Ges.Basel* 1961: 318 (*vogelii*); HIGGINS & RILEY 1970, *A Field Guide to the Butterflies of Britain and Europe*, p. 274, pl. 55, f. 11; DE LESSE 1970, *Bull.Soc.ent.Fr.* 75: 214; HIGGINS 1975, *The Classification of Lycaenidae & Riodinidae*, p. 368 (false 1910); RUNGS 1981, *Trav. Inst.scient.,Serie Zool., Rabat* 40: 454; HIGGINS & HARGREAVES 1983, *The Butterflies of Britain and Europe*, p. 76, f. male; DEVARENNE 1990, *Alexanor* 16 (1989): 151.

Plebejides vogelii (OBERTHÜR, 1920); in SAUTER 1968, *Mitt.ent.Ges.Basel, N.F.* 18: 4.

Maurus vogelii (OBERTHÜR, 1920); in BÁLINT 1991, *A Janus Pannonius Múzeum Évkönyve* 35 (1990) : 39.

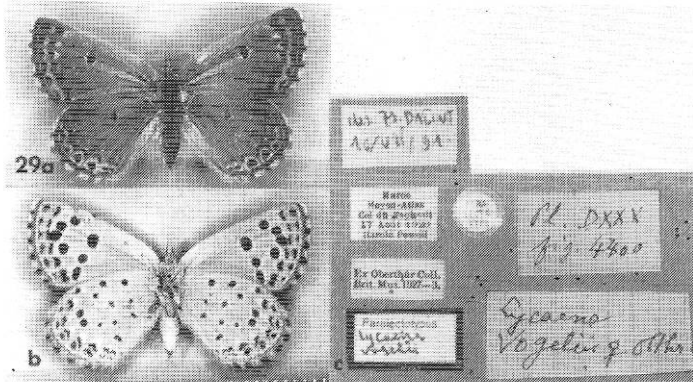


Fig. 28: *Lycaena vogelii* OBERTHÜR, 1920, lectotype male; a. upperside, b. underside, c. labels (Photo C. SMITH).

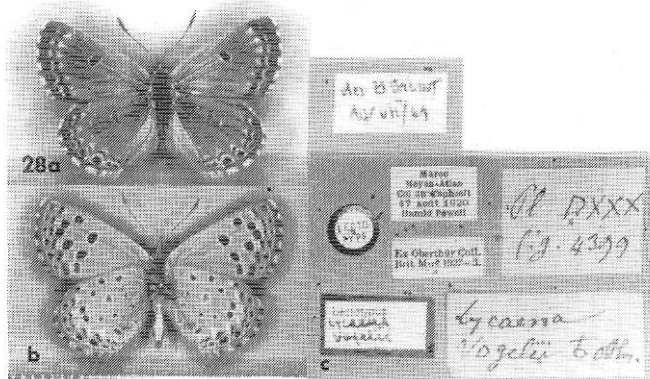


Fig. 29: *Lycaena vogelii* OBERTHÜR, 1920, paralectotype female; a. upperside, b. underside, c. labels (Photo C. SMITH).

Material of *Plebejus vogelii* (OBERTHÜR, 1920) examined
(Total: 123 specimens)

Morocco

-Middle Atlas: Col du Taghzeft, 2200m, 17.VIII.1920, 8m + 5f, H. POWELL (BMNH); 30.VIII.1987, 2m + 1f, JH (JH); no date, 16m + 72f, no collector (MNHP); 11.IX.1972, 1m, no collector (HNHM); 24.VIII.1982, 1m + 1f, JMM (JMM); 8.IX.1988, 7m + 9f, JMM (JMM); 10.IX.1988, 2m, JMM (JMM); 8.IX.1986, 15 specimen, JPB (JPB); 20.VIII.1990, 20 specimen (72 observed), JPB (JPB); Timhadit region, Itzer [32.54N 5.03W], no date, 31m + 5f, H. POWELL (BMNH).

Maurus was described as a separate genus according to the following superficial and ecological characters, which strongly differ from the two other Northwest African *Plebejus* species :

- both sexes brown;
- large discoidal spot on wings' upperside;

- marginal markings present on wings' upperside (better developed in female);
- fringes chequered;
- male genitalia different (fig. 30);
- different flight period (extremely late);
- different larval hostplant;
- only known from high altitude.

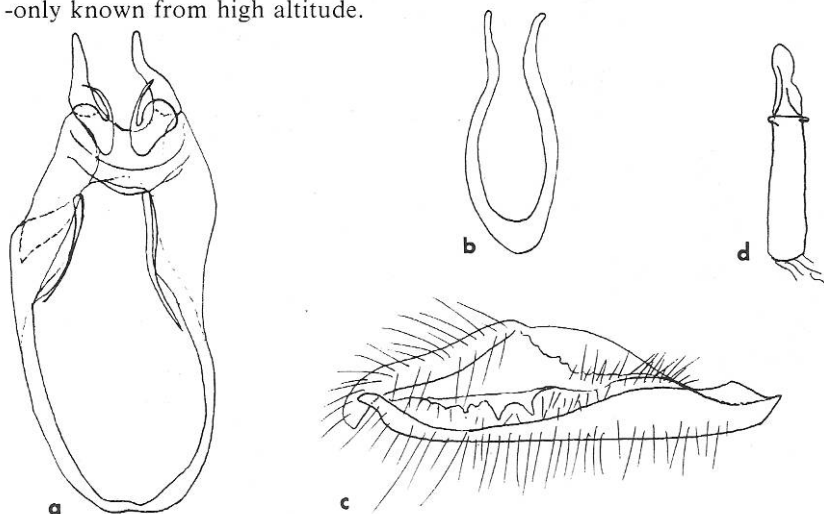


Fig. 30: *Plebejus (Maurus) vogelii* (OBERTHÜR, 1874), male genitalia, Morocco, Middle Atlas, Taghzeft Pass, 30.VIII.1987, JH leg. [prep. WDP 3106], a. uncus, tegumen and vinculum, b. furca, c. left valva, d. aedeagus.

In the present state of our knowledge on the Holarctic *Plebejus* group (cf. NABOKOV 1945!) it is very difficult to understand the systematic position of *Maurus*. Tentatively the third author regards *Maurus* as the youngest clade of Northwest African *Plebejus*, and this assumption will be confirmed or refuted after a cladistic study of the whole group.

Discussion

Habitat

Plebejus martini is a local species, flying in rough places with small shrubs, *Quercus ilex*, *Chamaerops humilis*, heather, *Thymus* etc. (SEITZ 1909, HIGGINS & RILEY 1970, BÁLINT 1991a). Most of the localities are situated at an altitude between 1000 and 1400m (Algeria) and between 1500 and 2100m (Morocco) reaching sometimes 2500m (RUNGS 1981). Some specimens were found at much lower altitudes: Oran (100-200m), Algiers (0-100m), Tlemcen mts. (900m).

Plebejus allardi flies in arid valleys and dry river beds (BOZANO & GIACOMAZZO 1988) with sparse low vegetation. The biotope on the isle of Jerba consists of sandy, arid, desert-like places with very low and sparse vegetation of shrubs, amid small corn fields bordered with verges on which sometimes



Fig. 31: Tunisia, Jerba, env. Houmt-Soukh, May 1990, habitat of *Plebejus (Plebejides) allardi* (OBERTHÜR, 1874) (Photo W. DE PRINS).

Opuntia is growing. Some of these fields were abandoned and have now a vegetation of different grass species and of a dry Umbelliferae species, smelling as fennel, on which larvae of *Papilio saharae* were feeding. Some date palm-trees and very rarely olive trees are scattered amongst those fields (see fig. 30). At the same time as we observed *allardi*, *Papaver* was in full bloom and the following butterfly species were on the wing (among others) : *Papilio saharae* OBERTHÜR, 1879, *Euchloe belemia* (ESPER, [1800]), *E. crameri* BUTLER, 1869, *E. charlonia* (DONZEL, 1842) and *Zizeeria karsandra* (MOORE, 1865).

Plebejus vogelii flies very locally in dry mountain habitats at high altitudes (1900-2500m) with very scarce vegetation.

Biology

P. martini larvae feed on *Astragalus incanus* ssp. *incurvus* (cf. THOMAS & MALLORIE 1985). OBERTHÜR (1915: 404) found a larva on *Acanthyllis numidica* of which the second instar made a whitish silken cocoon in the ground at the end of June. It stayed there until mid February of the next year. It was fed with *Astragalus massiliensis* but it died before reaching the third instar.

We could not find any reference of a foodplant for the larva of *P. allardi*. On the isle of Jerba we noticed that the specimens, especially the females, were always flying around a small shrub with lilac flowers, preferably growing along roadsides.

The larva of *P. vogelii* feeds on *Erodium cheiranthifolium*.

Phenology

Because *P. martini* occupies mainly habitats of higher altitude than *P. allardi* its flight period is later, although there is an important overlap, especially in the zone from 800 to 1400m where both species occur (see fig. 32). The main flight period of *martini* falls in the third decade of May (calculated from the date of 222 specimens). The earliest specimen studied was caught as early as mid March (Algeria, vic. Oran, Eckmuhl, 100-200m, 14.III.1972, O. & K. SLABÝ leg.), the latest at the beginning of July (Algeria, Tala-Rana, 5.VII.1918, H.C. NISSEN leg.).

The main flight period of *allardi* is situated in the last decade of April and the first one of May (total of 130 specimens studied). The earliest specimen studied was caught mid March (Libya, env. Tarabulus, Qasr Aswad, 0-100m, G. KRUSEMAN leg.), the latest towards mid June (Algeria, Oran, Sebdu, 900m, O. SLABÝ leg.). As far as we know, both species are single brooded, though 1 specimen of *allardi* bears a label «VIII.1934» (Hassi-Bahch, no collector, NNML). Apart from mislabeling, this could be a representative of a very partial second brood.

P. vogelii is thought by some authors (e.g. BÁLINT & KERTÉSZ 1990: 200) to produce two broods a year. However, there is no hard evidence for this. MOKHLES (1984: 260) mentions a long flight period from the end of May to the end of September and RUNGS (1981: 454) states: «VI et VII». Almost all other literature sources give only one brood for the species. All material examined was caught between mid August and mid September.

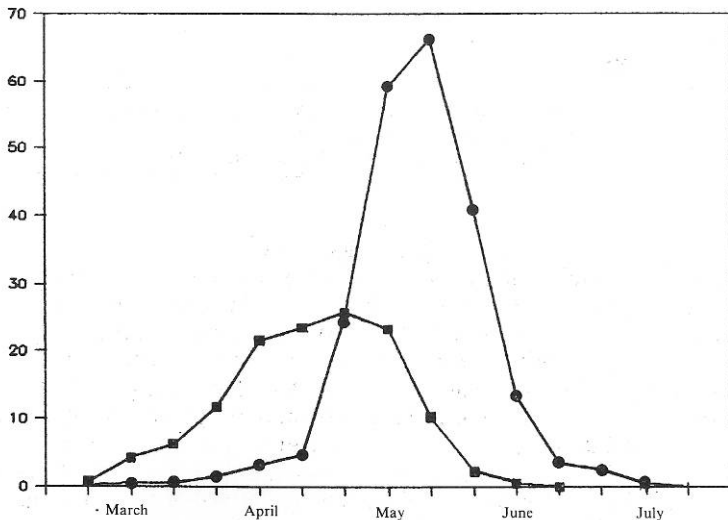


Fig. 32: Flight curve of *Plebejus (Plebejides) martini* (ALLARD, 1867) *Plebejus (Plebejides) allardi* (OBERTHÜR, 1874)

Distribution (fig. 33)

P. martini occurs from the Great Atlas in Morocco, through the Middle Atlas and Rif across several places in North Algeria to Northeast Algeria (the Aurès region). *P. allardi* is widespread from the Anti-Atlas in Morocco, some scattered places in this country, through the northwestern region of Algeria, the isle of Jerba in Tunisia to the region south of Tarabulus in Libya. The latter species occupies a larger region than *martini*, extending further south in Morocco and living far more to the east, and thus overlapping the range of *martini* completely. However, the two species almost never are syntopic because they occupy different biotopes at different altitudes. Nevertheless, there are two cases where both taxa come very close to each other: the neighbourhood of Algiers and the region of Sebdou (Tlemcen mountains). *P. vogelii* has a very restricted distribution and is confined to a small region in the Middle Atlas mountains, main habitat on the Taghzeft Pass and some smaller colonies in the neighbourhood of Timhadit and Itzer.

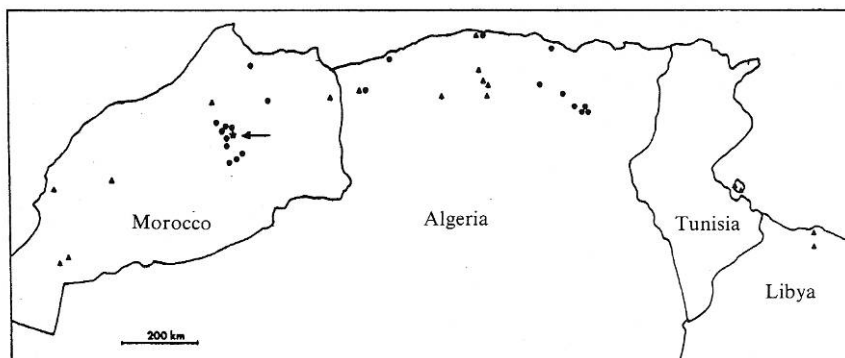


Fig. 33 : Map of N.W. Africa showing the distribution of
● *Plebejus (Plebejides) martini* (ALLARD, 1867)
▲ *Plebejus (Plebejides) allardi* (OBERTHÜR, 1874)
* *Plebejus (Maurus) vogelii* (OBERTHÜR, 1920)

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