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## **The species of *Miscophus* JURINE 1807 from the Canary Islands with description of a new species (Hymenoptera: Apoidea: Crabronidae)**

C. SCHMID-EGGER

**A b s t r a c t :** The species of *Miscophus* from the Canary Islands are revised, a key for all species is presented. The male of *M. carolinae* new species is described from Gran Canaria. *M. deserti* is a new synonym of *M. helveticus*. The origin of the species and their possible endemism are discussed.

**Key words :** Hymenoptera, Apoidea, Sphecidae, Crabronidae, *Miscophus*, key, new species, Canary Islands, endemism.

### **Introduction**

The genus *Miscophus* in the Mediterranean area was first revised by ANDRADE (1954, 1956a, b, 1960). He described or revised five species occurring on the Canary Islands. DE BEAUMONT (1968) described three additional species from the islands. HOHMANN et al. (1993) listed and summarized detailed records of *Miscophus* and other Sphecidae from the Canary Islands.

However, the identification of the Canarian species of *Miscophus* remains problematic because of the lack of a complete key. On this reason and because of the finding of an undescribed species on Gran Canaria by the author, a brief revision of the known species of the Canary Islands including a key to all species is presented. The project was facilitated because of the examination of many types, mainly from the de Beaumont's collection in Lausanne, in the course of a present revision of the genus *Miscophus* in the Palaearctis by the author.

### **Methods**

**Description :** The treated species are described in detail by ANDRADE (1954, 1960) and DE BEAUMONT (1968). To avoid long repetition of these descriptions, only brief descriptions and a short diagnosis in the text seems sufficient to characterize the species in the present paper. For most species, only literature citation concerning the fauna of the Canary Islands are given.

**Characters :** The morphologic terminology employed in this paper in general follows BOHART & MENKE (1976). Most characters used in the present key were also

used by ANDRADE (1954, 1960) and SCHMID-EGGER & BITSCH (2001). The Ratio of the distance between eye and hindocellus (OOL), the hindocellar diameter (HD) and the distance between both hindocelli (POL) is given. The HD is set to 1 for easier comparison.

**Distribution:** The distribution pattern summarizes information of ANDRADE (1954, 1960) and results of my own recent examinations.

**Records:** Only records of specimens are listed, which are examined personally. For some species, also records outside of the Canary Islands are listed. Information in square brackets [] means original text of a label.

**Sources of material:** The following abbreviations for sources of material and type depositories are used (depository given in brackets for each record. The collector is normally not listed in the text).

BMNH .....	British Museum Natural History, London/England
MHNP .....	Muséum d'Histoire Naturelle Paris/France
MZL .....	Musée Zoologique Lausanne/Switzerland
NHMH .....	Naturhistorisches Museum Wien/Austria
RMNH .....	Nationaal Natuurhistorisch Museum Leiden/Netherlands
SE .....	private coll. Christian Schmid-Egger, Herrsching/Germany
ZMA .....	Zoologisch Museum Amsterdam/Netherlands

### Key to males and females

- 1 Whole body microsculptured, dull. Larger species, longer than 5 mm. At least lower half of temples with erect whitish pilosity, as long as diameter of hindocellus. Female: Foretarsal spines well developed, last spine longer than second tarsal segment. Males: Sternite VIII bidentate. .... 2
- Body mostly shiny between sculpture. Smaller species, at most 6 mm long. Temples without (or with very short) pilosity. Female: Foretarsal spines in most species less developed or absent. Males: Sternite VIII with four teeth. .... 3
- 2 Body all black. First recurrent and first transversal cubital veins interstitial. 8 mm. Gran Canaria.....*M. primogeniti* ANDRADE
- First abdominal segment, parts of legs and tegulae reddish. First recurrent and first transversal cubital veins not interstitial. 6-9 mm. Tenerife, Fuerteventura, Lanzarote. ....*M. helveticus* KOHL
- 3 Anterior margin of clypeus continuous, without indentations. 5-6 mm. Tenerife, Gran Canaria, Fuerteventura, Lanzarote.....*M. pseudomimeticus* ANDRADE female
- Anterior margin of clypeus divided into three parts. .... 4
- 4 Propodeal surface and sides grainlike microsculptured or laterally with some punctures on a shiny surface, without wrinkles or stripes. Scape yellow below. .... 5
- Propodeal surface and sides markedly wrinkled or striped and with shiny interspaces. Scape in most species black..... 8
- 5 Midflagellomeres as long as their apical width. Flagellomere I as long as pedicel. Legs partly yellow-whitish. Dorsal surface of propodeum nearly square-like. .... 6.
- Midflagellomeres longer than their apical width. Flagellomere I 1,5 as long as pedicel. Legs black and reddish. Dorsal surface of propodeum apically narrowed..... 7

- 6 Pronotal lobe and tibiae I-III at outside all whitish-yellow. Femora I apically with large, femora II with small pale spot. Wing venation reddish. Frons dull. 3 mm. Fuerteventura.....*M. albomaculatus* ANDRADE
- Pronotal lobe black. Tibiae I-III only basally with small pale spot. Femora I apically black or with small spot. Wing venation brown. Frons somewhat shiny between micropunctuation. 3 mm. Gran Canaria. Female unknown. ....*M. carolinae* new species
- 7 Tenerife. Legs including femora I-III and clypeus partly reddish. 3-5 mm. ....*M. canariensis canariensis* DE BEAUMONT
- Gran Canaria. Femora I-III and clypeus, except apical margin, black. Tibiae and tarsi reddish. 3-5 mm. ....*M. canariensis nigrifemur* DE BEAUMONT
- 8 Males. Dorsal surface of propodeum finely diagonal striate, interspaces covered with a fine pubescence. Propodeal surface somewhat longer than wide. 4-5 mm. Tenerife, Gran Canaria, Fuerteventura, Lanzarote..... *M. pseudomimeticus* ANDRADE male
- Males and females. Dorsal surface of propodeum coarsely diagonal or horizontal striate, or if finely striate, interspaces shiny, without any pubescence. Males: Propodeum as long as wide ..... 9
- 9 Propodeal surface finely and evenly diagonally striate, with 15-20 stripes. Mesopleura horizontally striate, densely punctate (interspaces smaller than punctures). Frons finely structured. 4-5 mm. Fuerteventura, Lanzarote. ....*M. guichardi* DE BEAUMONT
- Propodeal surface coarsely striate, or large shiny interspaces between striae. Mesopleura smooth, interspaces larger than punctures. Frons coarsely punctured..... 10
- 10 Tenerife. Body in general less shiny, punctuation denser as following species. Striation on propodeal surface in female dense, irregular. (Both species can be identified better by direct comparision). .... *M. eatoni* SAUNDERS
- Gran Canaria, La Gomera. Body more shiny, punctuation coarser as in *M. eatoni*. Striation on propodeal surface in female coarse, regular, with large shiny interspaces.....  
..... *M. nitidior* DE BEAUMONT

### Discussion of species

#### *Miscophus albomaculatus* ANDRADE 1960

*Miscophus albomaculatus* ANDRADE 1960: 39, female. Holotype: female, Israel: Nahariya (RMNH). – DE BEAUMONT 1968: 264 (Canary Islands: Fuerteventura). – HOHMANN et al. 1993: 221 (detailed records from Canary Islands).

**D i a g n o s i s :** *M. albomaculatus* belongs to the *M. aenigma*-subgroup in the *M. bicolor* group sensu ANDRADE (1960), which is characterized by short flagellomeres, a fine and grainlike sculptured propodeal surface and a small body size (appr. 3 mm). *M. albomaculatus* is unique in the *M. aenigma*-subgroup by its white spot on the pronotal lobe, by a large yellow-whitish spot on the apex of femora I and by a yellow outside of tibiae I-III. *M. carolinae* n. sp. from Gran Canaria, which belongs also to the *M. aenigma*-subgroup, has a dark pronotal lobe and partly dark tibiae.

**D i s c u s s i o n :** *M. albomaculatus* is described from Israel. DE BEAUMONT (1968) compared the specimens from Fuerteventura with the type and concluded, that both taxa are conspecific. He noted small differences in structure and color between the type and the specimens from the Canary Islands. In my opinion, the question is open whether *M. albomaculatus* from Israel is conspecific with the Canarian populations. A similar case is between *M. carolinae* from Gran Canaria and *M. aenigma* from Egypt. Both are similar and only distinguished by small differences in color, color pattern and body structure, what – as I think – justify their treatment as two species. All remaining species of the *M.*

*aenigma*-subgroup are also very similar in color and morphology and occur each only in a small range (ANDRADE 1960). However, it is worthy of mention from an zoogeographical viewpoint that, in two cases, such closely related taxa occur as well in the south-eastern Mediterranean area as on the Canary Islands.

**Description of female:** 3,5 mm. Black, dark-yellow are: scape below, tarsi I-III. Pale yellow are: outside of tibiae I-III, a large patch on forefemora apically (1/3 length of femora), a small patch on midfemora apically, praecostal plates of wings I and II, pronotal lobe. Wings all hyaline. Flagellomeres as long as apical width, flagellomer I as long as pedicel. Foretarsi without spines. Frons, mesoscutum and tergites finely grainlike punctured, somewhat shiny. Propodeal surface densely and finely grainlike sculptured, with a median line. Ratio OOL : HD : POL = 1,7 : 1 : 2,9.

**Description of male:** (from DE BEAUMONT 1968) similar to female. Pale color more extended as in female. Apical margin of clypeus widely triangular, with an indistinct median angle.

**Geographical distribution:** Israel. Canary Islands: Fuerteventura.

**Records:** Fuerteventura: Female 6.5.1964 Puerto del Rosario (det Beaumont, MZL).

### ***Miscophus canariensis* DE BEAUMONT 1968**

*Miscophus canariensis* DE BEAUMONT 1968: 264, female, male. Holotype: female, Canary Islands: Tenerife: Los Cristianos (BMNH) – HOHMANN et al. 1993: 222 (detailed records from Canary Islands). Paratype examined.

*Miscophus canariensis nigrifemur* DE BEAUMONT 1968: 265, female, male. Holotype: female, Canary Islands: Gran Canaria: Maspalomas (BMNH). – HOHMANN et al. 1993: 223 (detailed records from Canary Islands). Paratype examined.

**Diagnosis:** The species belong to the *M. nicolai*-subgroup in the *M. bicolor* group sensu ANDRADE (1960). The subgroup is characterized by a grainlike structure on the propodeal surface. The females of *M. canariensis* are unique among the Canarian species by three forebasitarsal spines, the females and males by red legs (femora black in ssp. *M. nigrifemur*), and by a markedly body punctation (punctures are easily visible, and appr. a diameter apart). The propodeal surface has a distinct median line without lateral wrinkles. The similar *M. gibbicollis* from the Atlantic coast in Morocco has a less distinct body puncture, the punctures are minute, only shallowly impressed and more than a diameter apart.

**Discussion:** DE BEAUMONT (1968) described two subspecies from the Canary island, *M. canariensis* s. str. from Tenerife with completely red legs, and *M. canariensis nigrifemur* from Gran Canaria with only the tibiae and tarsi reddish. It is a question of taste, if such a color pattern justifies the description of a subspecies or if a status as «form» would had been adequate. As both taxa are geographically clearly separated, I will not change the formal state of them.

The second and more important question is whether *M. gibbicollis* and *M. canariensis* are conspecific. Both species are very similar and only distinguishable by their different kind of punctation. The differences between both taxa are comparable with these of *M. verhoeffi* from south-west Europe and *M. verhoeffi nitidus* from north-west Africa. But as a formal synonymisation will not bring any advantages for science, I will not change the status of *M. gibbicollis* and *M. canariensis*.

**Description of female:** 4-5 mm. Black with copper-colored shimmer.

Dark reddish are: apical margin of clypeus, mandible (except black apex), scape below, legs (the ssp. *M. nigrifemur* has black femora I-III). Wings greyish, zone beyond wing venation markedly clouded. Frons finely punctured with indistinct interspaces, whole frons somewhat shiny. Foremetatarsus with three long spines, last spine as long as 1,5x length of 2. tarsomere. Mesoscutum and mesopleura shiny, finely punctured, punctures 1-2 diameters apart. Propodeal surface laterally with punctures, some diameters apart, with median line, basally somewhat indistinct sculptured, with scattered pale pubescence. Tergites indistinctly punctured, last tergites smooth. Ratio OOL : HD : POL = 1,8 : 1 : 2,3.

**Description of male:** 3-4 mm. Similar to female, apical margin of clypeus triangular with obtuse angle. Ratio OOL : HD : POL = 1,8 : 1 : 1,8.

**Geographic distribution:** Canary Islands: Teneriffa and Gran Canaria.

**Records:** Tenerife: male, female 19.7.1966 Los Cristianos [*Miscophus canariensis* det. DE BEAUMONT 1967, Paratype] (MZL). Gran Canaria: male 17.6.1964 female 16.8.1966, Maspalomas Cristianos [*Miscophus canariensis nigrifemur* det. de Beaumont 1967, Paratype] (MZL); 6 males 3 females 1 March 2002 dunes south of Maspalomas, near lighthouse, 27°44'N 15°33'W, in yellow pan traps (SE).

### *Miscophus carolinae* new species

**Diagnosis:** *M. carolinae* belongs to the *M. aenigma*-subgroup in the *M. bicolor* group sensu ANDRADE (1960), which is characterized by short flagellomeres, a fine and grainlike sculptured propodeal surface and a small body size (appr. 3 mm). *M. carolinae* is characterized by short pale stripes at base of tibiae I-III and by a very small pale patch at the forefemora apically. It shares the mentioned characters with *M. aenigma* from Egypt, but it can be distinguished from the *M. aenigma* male as follows: Frons densely microsculptured without shiny interspaces, but in general shiny (*M. aenigma*: frons with shiny interspaces between micropunctures); last flagellomere somewhat longer than flagellomere X (as long as); OOL : HD : POL = 1 : 1 : 2 (1,2 : 1 : 1), spots on tibiae II-III shorter than half tibial length (longer than); forefemora black or with small dark yellow patch (with large whitish-yellow patch). *M. albomaculata* from Fuerteventura has in both sexes a pale colored pronotal lobe, the outside of tibiae I-III is all pale yellow. Its frons is dull, compared with the shiny frons of *M. carolinae*.

**Discussion:** *M. carolinae* is, without doubt, very similar to *M. aenigma* from Egypt. The small, but visible differences in color pattern and sculpture and the long geographical distance between both origins however, strengthen my opinion to describe it as a new species. A relationship with *M. albomaculata* from Fuerteventura is not probable because of the marked differences in color pattern and body structure. The *M. aenigma*-subgroup comprises a few very similar species, which all are restricted to small geographic areas.

**Description of male:** 3 mm. Black, dark yellow are: apical half of mandible, scape, pedicel and flagellomeres I-II below, patch on forefemora apically, on tibiae I-III basally and apically, on basitarsus I-III. Remaining tarsi partly pale. Wing venation basally partly pale, remaining part brown. Leg coloration on paratype is more whitish-yellow, stripes are larger than in holotype.

Flagellomere I as long as its apical width, as long as pedicel. Flagellomeres II-X somewhat longer than wide, flagellomere XI longer than flagellomere X, pointed. Frons shiny,

with dense punctation, no interspaces visible. OOL : HD : POL = 1 : 1 : 2. Structure of mesonotum, scutellum, mesopleuron, tergites and sternites as frons. Propodeum (view from above) square-like, its surface shiny with a dense punctation and visible interspaces, covered with a short silver pubescence.

**F e m a l e :** Unknown.

**E t y m o l o g y :** The species is named after my girl-friend Caroline Krüll, who supported the trip to Gran Canaria and who was very helpful in managing the yellow pan traps.

**G e o g r a p h i c   d i s t r i b u t i o n :** Canary Islands: Gran Canaria.

**R e c o r d s :** HOLOTYPE and PARATYPE: 2 males 1 March 2002 Gran Canaria, dunes south of Maspalomas, near lighthouse, 27°44'N 15°33'W, in yellow pan traps, leg and coll. SE.

### ***Miscophus eatoni* E. SAUNDERS 1903**

*Miscophus eatoni* E. SAUNDERS 1903...: 209, female. Holotype (or syntypes?): female, Canary Islands: Tenerife: Orotava (BMNH). – ANDRADE 1960: 125 (revision). – DE BEAUMONT 1968: 267 (Canary Islands: Tenerife). – HOHMANN et al. 1993: 224 (detailed records from Canary Islands).

**D i a g n o s i s :** *M. eatoni* is a member of the *M. bicolor* subgroup sensu ANDRADE (1960). It is characterized by a complete black body color, a sparse punctation on the epimera and a – compared with other species – very coarse grainlike sculpture on the frons. On the Canary islands it can be confused with *M. nitidior*, which occurs only in Gran Canaria. *M. eatoni* has metallic reflections and is less shiny compared with *M. nititor*. Its frons is coarser sculptured as in *M. nitidior*, the propodeal surface is less shiny and denser striate. Both species can best identified when compared directly. See also remarks at *M. guichardi*.

**D e s c r i p t i o n :** See description at ANDRADE (1960) or SCHMID-EGGER & BITSCH (2001).

**G e o g r a p h i c   d i s t r i b u t i o n :** Southwest Europe to Switzerland, north-west Africa. Canary Islands: Tenerife.

**R e c o r d s :** No specimens from the Canary Islands were examined.

### ***Miscophus guichardi* DE BEAUMONT 1968**

*Miscophus guichardi* DE BEAUMONT 1968: 268, female, male. Holotype: female, Canary Islands: Fuerteventura: Puerto del Rosario (BMNH). – HOHMANN et al. 1993: 225 (detailed records from Canary Islands). Paratype examined.

**D i a g n o s i s :** *M. guichardi* is a member of the *M. bicolor* subgroup sensu ANDRADE (1960). It resembles *M. eatoni* and *M. nitidior*, but it is in general less coarse sculptured. It is characterized by the fine sculpture on the frons and the propodeal surface, by the fine punctation on the mesonotum and the finely striate mesopleura.

**D e s c r i p t i o n   o f   f e m a l e :** 4-4,5 mm. Black, mandible reddish except apex. Scape apically below and hindtarsus brown. Apical margin of clypeus similar to *M. eatoni*. Frons somewhat shiny, densely and finely micropunctate. Punctures and interspaces on lower frons indistinct, near ocelli distinct. Mesoscutum, scutellum and tergites shiny, finely micropunctate. Mesopleura shiny, finely horizontally striate, with punctures between striae. Epimera in apical half with a smooth area. Propodeal surface shiny, with

distinct median line, laterally with 15-20 even and fine diagonal striae, and some punctures inbetween. Propodeum laterally striate. Tergites I-III laterally with a short band of silver pubescence. Forebasitarsus with two short spines. Wings hyaline, somewhat greyish clouded. Ratio OOL : HD : POL = 0,7 : 1 : 1,2.

**Description of male.** 3,7 – 4 mm. The male, in general, is similar in color and sculpture to the female. The apical margin of the clypeus is triangular with an obtuse angle.

**Geographic distribution:** Canary Islands: Lanzarote and Fuerteventura.

**Records:** Lanzarote: female 24.5.1964 Tahiche [Paratype det de Beaumont 1967] (MZL); Fuerteventura: male 10.5.1964 Corralejos [Paratype det de Beaumont 1967] (MZL); female 10.3.2001 Municipio la Olivia, Corralejo (SE).

### ***Miscophus helveticus* KOHL 1883**

Only literature citation of *M. deserti* are listed:

*Miscophus deserti* BERLAND 1943. type: female in MHNP, examined. – ANDRADE 1954: 54 (revision). – DE BEAUMONT 1956a: 205 (Libya), 1957a: 144 (Morocco), 1968: 263 (Canary Islands: Lanzarote, Fuerteventura). – HOHMANN et al. 1993: 223 (detailed records from Canary Islands). New synonym of *M. helveticus*.

**Discussion:** *M. helveticus* occurs in some color forms, which had been described as various forms, subspecies or species. The examined type of *M. deserti* from Rio de Oro has light red tibiae I-III (tibiae I-II dark below). The sternites I-II and tergites I, II and the basal half of tergite III are light reddish. The apical free margin of the clypeus is obtuse angled, not more red or translucent as in specimens of *M. helveticus* from central or southern Morocco. It has a less dense pilosity on the lower face, compared to the typical *helveticus*. The specimen from Goulimine is similar to the type, but has a more distinct translucent free margin of the clypeus. The specimen from Fuerteventura has red femora II and III (femora II is black above), the abdomen is complete reddish, the last sternites and tergites are slightly darkened.

I could not find any specific characters to distinguish *M. deserti* from the north African form of *M. helveticus*, which ANDRADE described as ssp. *M. viator*. The ssp. *M. viator* is in my opinion not a ssp., but a form of *M. helveticus*. So, *M. deserti* is a very light form with a very translucent clypeal free margin of *M. helveticus* occurring in the Sahara desert and at the Canary Islands and not a species. *Miscophus deserti* = new synonym. The subject will be discussed in detail in a following paper.

**Diagnosis:** *M. helveticus* is a member of the *M. helveticus* (former: *M. gallicus*) group. The Canarian specimens are characterized by (partly) red legs and an partly or all red gaster. The female has three long foretarsal spines.

**Description:** See description by ANDRADE (1960) or SCHMID-EGGER & BITSCH (2001).

**Geographic distribution:** Western Palearctic region, northwards to Switzerland. Canary Islands: Tenerife, Fuerteventura, Lanzarote.

**Records:** All examined records of *Miscophus 'deserti'* Berland are listed: Rio de Oro (Spanish Sahara), female Villa Cisneros (MHNP) [*Miscophus deserti* Berland, L. Berland 1949] [TYPE] – Morocco: female 5.5.1947 Goulimine (MZL) [*Miscophus deserti* Berl.: Andrade (det) 1954] – Canary Islands: female 9.5.1964 Fuerteventura, Corralejos (MZL) [*Miscophus deserti* Berl. J.d. Beaumont det 1967], – Algeria: female 5.(18)91 Biskra (NHMW) [*Miscophus deserti*: Andrade (det) 1954] (abdomen black, tibia and femora apically red, pilosity of lower face dense, clypeal free margin reddish)

### ***Miscophus nitidior* DE BEAUMONT 1968**

*Miscophus nitidior* DE BEAUMONT 1968: 267, female, male. Holotype: female, Canary Islands: Gran Canaria: Maspalomas (BMNH). – HOHMANN et al. 1993: 226 (detailed records from Canary Islands). Paratype examined.

**D i a g n o s i s :** *M. nitidior* is a member of the *M. bicolor* subgroup sensu ANDRADE (1960). It resembles *M. eatoni*, but it is in general somewhat less coarse sculptured and more shiny. It is characterized by large shiny interspaces between striae on the propodeal surface. Distinction from *M. eatoni* by description is difficult and can best be seen in direct comparison. The also similar *M. guichardi* from Lanzarote and Fuerteventura is less coarse punctate and sculptured.

**D i s c u s s i o n :** The relationship between *M. eatoni*, *M. nitidior*, and the unknown species from La Gomera (see below) is not solved satisfactory. All taxa are, without doubt, very similar and also DE BEAUMONT (1968) discussed their state as real species. *M. guichardi*, which belong also to the closer relationship of *M. eatoni* and *M. nitidior*, can be distinguished by some good visible character differences. It gives a hint towards a development of species distinction on the Canary Islands.

**D e s c r i p t i o n o f f e m a l e :** 5 mm. Body all black. Grainlike sculpture on frons is dense and as coarse as in *M. eatoni*. Punctuation on mesoscutum sparse, punctures 1-1,5 diameters apart, interspaces shiny. Propodeal surface shiny, with 12-14 striae, which are in basal part diagonal, in apical part horizontal (right angled towards the central line). Spaces between striae large (half ocellar diameter). Tergite I and II densely and markedly punctate, punctures 1 diameter apart.

**D e s c r i p t i o n o f m a l e :** 4-5 mm. Similar to female, body puncture more sparse and indistinct. Genitalia similar to this of *M. eatoni*. Outside of gonostylus in both species with a row of long setae, which is not visible in the fig. 62c in SCHMID-EGGER & BITSCH (2001).

**G e o g r a p h i c d i s t r i b u t i o n :** Canary Islands: Gran Canaria. DE BEAUMONT (1968) mentioned a single male from La Gomera which he suspected to belong to *M. nitidior* or to an undescribed species. It is larger and has a slightly different body sculpture. I could not examine the specimen yet.

**R e c o r d s :** Gran Canaria female 24.6.1966 El Palmital 400m [Paratype det de Beaumont 1967] (MZL); male 27.3.1970 San Agustín [det de Beaumont 1970] (MZL); 3 males 1 March 2002 Gran Canaria, dunes south of Maspalomas, near lighthouse, 27°44'N 15°33'W, in yellow pan traps (SE).

### ***Miscophus primogeniti* ANDRADE 1954**

*Miscophus primogeniti* ANDRADE 1954: 76, female. Holotype: female, Canary Islands: Gran Canaria: Cruz de Tejada (MNHN), examined. – DE BEAUMONT 1968: 263 (Canary Islands: Gran Canaria). – HOHMANN et al. 1993: 227 (detailed records from Canary Islands).

As *Miscophus eatoni*: GINER MARÍ 1945b: 361 (Canary Islands: Gran Canaria: El Carrizal), corrected to *Miscophus primogeniti* by ANDRADE 1954: 76.

**D i a g n o s i s :** *M. primogeniti* is a member of the *M. helveticus* group (*M. gallicus* group sensu ANDRADE (1954), see also SCHMID-EGGER & BITSCH (2001)). It is characterized by the complete fine body sculpture without punctures or shiny spaces (except mesosternum) and three long foremetatarsal spines. The body color is all black with reddish mandibles and brown tarsi, whereas *M. helveticus* (= *M. deserti*) from the Canary islands has a red colored abdomen and red legs. Black forms of *M. helveticus* have a

copper colored shimmer on body surface (dull in *M. primogeniti*), a short pubescence on the face and propodeal surface (without pubescence) and silver apical bands on tergites I-IV (without bands).

**Discussion:** Until now, the species was only recored from the Canary Islands. I could also examine a female from Morocco. In direct comparisation remain do doubt that the female belongs to *M. primogeniti*. It differs from the Canarian species as follows: anterior margin of clypeus more reddish (less reddish to black in specimens from Gran Canaria), mesopleuron microsculptured until edge of mesosternum (more smooth and shiny in under forth of mesopleuron). Also, *M. helveticus* in Morocco normally has a red abdominal base. However, ANDRADE (1954) reported two black colored specimens of *M. helveticus* (= *M. gallicus* s.str. sensu ANDRADE) from central Morocco. Further research has to solve the problem about *M. primogeniti* and other black forms of the *M. helveticus* group in Morocco.

**Description of female:** 7-7,5 mm. Wings greyish infusate, beyond venation zone dark brownish clouded. Morphology and body structure similar to *M. helveticus*. Ratio OOL : HD : POL = 1 : 1 : 1,4.

**Description of male:** 6-7 mm. Agree well with the female in color and morphology. Body pubescence reduced to some setae around scapi, whereas the similar *M. helveticus* has a dense pubescence on head and thorax. Tergites without apical bands as the females.

**Geographic distribution:** Morocco. Canary Islands: Gran Canaria.

**Records:** Gran Canaria: female Cruz de Tejada, 1000 m (MHNP) [*Miscophus primogeniti* m., Holotypus, Andrade 54] - female 18.6.1964 La Isleta (MLS) - female 14.6.1995 Maspalomas (SE) - female 29.3.1987 Las Cascas, 2 km N Arguineguin; 2 males Tauro, 6km NW Arguineguin (ZMA) male 1 March 2002 dunes south of Maspalomas, near lighthouse, 27°44'N 15°33'W, in yellow pan traps, (SE.). - Morocco: female 14.7.1977 Ht. Atlas, Toubkal Massif, Arhbalou (435km S Marrakesh) 1000 m NN (ZMA).

### ***Miscophus pseudomimeticus* ANDRADE 1960**

*Miscophus pseudomimeticus* ANDRADE 1960: 81, female. Holotype: female, Tunisia: Tozeur (RMNH). - de BEAUMONT 1968: 266 (Canary Islands: Fuerteventura, Gran Canaria). - HOHMANN et al. 1993: 228 (detailed records from Canary Islands).

**Diagnosis:** *M. pseudomimeticus* belongs to a species group with a continuous apical margin of the clypeus in female sex (*M. mimeticus* subgroup). It is divided into three parts at all remaining species on the Canary islands. So the female is unique and easily to recognize. It is also characterized by its densely punctated mesopleuron, which is covered with a dense silver pubescence. Scape, tibiae and tarsi are reddish, in some specimens also the apical margin of the clypeus is reddish. The anterior margin of the clypeus is more curved and more waved as in the remaining species of the *M. mimeticus* subgroup. The tegulae are completely pale yellow.

The male lacks the clear character on the clypeus. Morphologically it stands between the members of the *M. bicolor*-subgroup (*M. eatoni*, *M. guichardi*, *M. nitidior*) and the *M. nicolai* subgroup (*M. canariensis*). It can be recognized by the copper-colored shimmer on the whole body and the finely striate propodeal surface with a marked pubescence. Body punctation is sparse and indistinct. The similar *M. guichardi* is black without such

a shimmer, the propodeal surface is smooth without any pubescence. *M. eatoni* and *M. nitidior* are more densely punctate and don't have any pubescence.

**Description of female:** 6-7 mm. Black with copper-colored shimmer. Reddish are: mandibles, scape below and tegulae. Tibiae and tarsi brownish-red. Frons densely and finely grainlike punctured. Mesoscutum distinctly punctured, with marked interspaces. Mesopleura similar, in lower half covered with dense pubescence. Propodeal surface with indistinct diagonal striae, mixed with punctures, all covered with a fine pubescence. Tergites finely grainlike sculptured. Foremetatarsus with three fine spines, last spine as long as second tarsus. Wings hyaline to yellowish infusate, outer zone dark infusate. Ratio OOL : HD : POL = 1,6 : 1 : 2.

**Description of male:** I could not examine a male. The above given description bases on descriptions and on characters of the closely related male of *mimeticus*.

**Geographic distribution:** Israel, North Africa. Canary Islands: Tenerife, Gran Canaria, Fuerteventura, Lanzarote.

**Records:** Only specimens from northern Africa and Israel were examined.

### The origin of the species and their endemism

Each discussion of endemic forms on the Canary Islands presuppose a clear result about the specific state of any taxa. As shown in tab. 1, it is not possible to decide this point for all specimens of *Miscophus* finally. Closely related forms of *M. canariensis* and *M. carolinae* n. sp. occur on the African mainland. Also the question whether *M. albomaculata* from Israel and Fuerteventura or *M. primogeniti* from Morocco and from Gran Canaria are conspecific, is open in my opinion. And the species group around *M. eatoni* and *M. nitidior* on the African mainland is not solved at all. The next question is about the value of 'morphospecies' (species, which are only defined on morphology without any data about genes, enzymes, behaviour etc.) in discussions about endemism.

Nevertheless, some important observations can be made. Five species of the *Miscophus* fauna of the Canarian Islands occur only at one Island, two of them are probably endemic. This is evidence for strong isolating barriers between the islands. This fact is also confirmed by the existence of two different color forms of *M. canariensis* in Tenerife and Gran Canaria. This observation supports the theory of "neo-endemism" (HOHMANN et al 1993)

Another important observation is the fact, that the next closely related species of *M. albomaculata* and *M. carolinae* both occur in Israel, respectively in Egypt. Both species support the theory of "palaeo-endemism" (HOHMANN et al. 1993).

It is also of interest that the (in the Mediterranean area) widely distributed species *M. eatoni* and *M. pseudomimeticus* are restricted in their Canarian range to one island only, and *M. helveticus* from southern Morocco and western Sahara occur only on the eastern islands (except a single record from Tenerife). Perhaps the distributions of the first species are a result of an accidentally colonization, whereas *M. helveticus* comes directly (and regularly?) from the African mainland to Lanzarote and Fuerteventura, but is not able to colonize the western islands.

Tab. 1: The species of *Miscophus* from the Canary Islands and their overall distribution.

Valid name	A	B	C	D	E	F	Endemic
<i>albomaculatus</i> ANDRADE 1960		x			x		no?
<i>canariensis</i> DE BEAUMONT 1968	x		x			x	yes?
<i>carolinae</i> new species	x	x				x	yes?
<i>eatoni</i> E. SAUNDERS 1903		x		x			no
<i>guichardi</i> DE BEAUMONT 1968	x		x				yes
<i>helveticus</i> KOHL 1883			x	x			no
<i>nitidior</i> DE BEAUMONT 1968	x	x					yes
<i>primogeniti</i> ANDRADE 1954		x			x		no?
<i>pseudomimeticus</i> ANDRADE 1960			x	x			no

A: Occuring at the Canary Islands only

B: Occuring at one island of the Canary Islands only

C: Occuring at two or more islands of the Canary Islands

D: Occuring in a large range of the Mediterranean

E: Occuring in a small range outside of the Canary Islands

F: A close related form occurs outside of the Canary Islands

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### Zusammenfassung

Die *Miscophus*-Arten der Kanarischen Inseln werden revidiert, ein Schlüssel für alle Arten wird erstellt. Das Männchen von *M. carolinae* spec. nov. wird von Gran Canaria beschrieben. *M. deserti* ist ein neues Synonym von *M. helveticus*. Die Herkunft der Arten und ihr möglicher Endemismus werden diskutiert.

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Address of the author: Dr. Christian SCHMID-EGGER  
Kirchstr. 1  
D-82211 Herrsching, Germany  
Email: [c.schmid-egger@t-online.de](mailto:c.schmid-egger@t-online.de)

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