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ON THE IDENTITY OF *SITONA BICOLOR* FÅHRAEUS, 1840

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Abstract: *Sitona bicolor* Fåhraeus, 1840, was considered until now as a species very similar to *S. concavirostris* Hochhuth, 1851, both with concave frons and with elytra covered by long setae. A study of the type revealed that the frons in *S. bicolor* is flat, and not concave as had been previously considered by authors. Moreover, *Sitona burlinii* Solari, 1948 is not a synonym of *S. bicolor*, but of *S. humeralis* Stephens, 1831.
Key words: Sitonini, *Sitona bicolor*, *Sitona concavirostris*, synonymy.

Sobre la identidad de *Sitona bicolor* Fahraeus, 1840
Resumen: *Sitona bicolor* Fåhraeus, 1840 se ha considerado hasta el momento como una especie muy similar a *S. concavirostris* Hochhuth, 1851, ambas con frente cóncava y largas sedas elitrales. El estudio del Tipo reveló que la frente en *S. bicolor* es plana y no cóncava como se ha venido considerando por diversos autores. Además, *Sitona burlinii* Solari, 1948 no es sinónima de *S. bicolor*, sino de *S. humeralis* Stephens, 1831.
Palabras clave: Sitonini, *Sitona bicolor*, *Sitona concavirostris*, sinonimia.

Introduction

Sitona bicolor belongs to a group of species with narrow frons and proacetabuli distant from the prosternal line (group Angustifrontes of Reitter). Within this group, there is a smaller group of very similar species, the so-called *S. humeralis* group of species (Solari, 1948, Roudier, 1980, Aeschlimann, 1984). They were characterized by the pronotum with fine punctures and the frons and rostrum deeply excavated. This group was considered to be formed by four species: *S. humeralis* Stephens, *S. discoideus* Gyllenhal, *S. concavirostris* Hochhuth and *S. bicolor* Fåhraeus.

However, when Fåhraeus (1840: 275) described *S. bicolor* from Dalmatia (east coast of Adriatic sea) he indicated that its frons is almost flat: "*fronte sub-plana, canicula in medio profunde impressa ...*". This trait was confirmed by the first reviser of the genus, Allard (1865): "*fronte subplana*", and also by Stierlin (1885): "*Stirn eben*". How can this species be considered at present to have an excavate rostrum? The story took three steps

1. Reitter (1903) claimed that the species identified by Stierlin as *S. bicolor* was in fact *S. cylindricollis* Fåhraeus, a species of Angustifrontes with a flat frons. Following Reitter, the true *S. bicolor* should have a deeply excavated head and rostrum: "*Stirn und Rüssel ... dachförmig ausgehölt*". Müller (1913) followed Reitter's contention.

2. Solari (1948) was the first author to consider a group of *S. humeralis* characterized by the concave head and rostrum ("*fronte e rostro sono scavati a guisa di cunetta...*"), and including *S. bicolor*. He also described in the group two new species, *S. separandus* and *S. burlinii.* Solari stated that Fåhraeus was confused by an optical illusion when he described the frons of *S. bicolor* (!): "*io credo che l'espressone usata sia dovuta ad illusione ottica: la fronte sembra quasi plana perchè è relativamente larga e la depressione si confonde col solco mediano...*"

3. Roudier (1980) considered *S. concavirostris* as a subspecies of *S. bicolor*, with both differing from other species with excavate frons by the erect elytral setae. He synonymized the two species described by Solari, *S. separandus* and *S. burlinii* with *S. bicolor*.

4. Bahr *et al.* (2006) in their key to European *Sitona* included *S. bicolor* within species with excavate frons: "*Frons with a deep V- shaped incision*". *S. concavirostris* was not considered a subspecies, but a related species. They stated that *S. bicolor* can be distinguished because its frons is even more concave than in *S. concavirostris*.

Material and methods

Several specimens of *Sitona* of the *humeralis*-group with flat frons were selected during the study of two collections, the Museum National d'Histoire Naturelle, Paris, France (MNHN), and the National Collection of Insects, National Museum of Natural History, Department of Zoology, Tel Aviv University, Israel (TAUI). A few specimens from this last Museum are now located at the collection of the first author (CVC). The type specimen of *Sitona bicolor* was borrowed from the Naturhistoriska Rikmuseet, Stockholm, Sweden (NRM). The type specimen of *S. burlini* was borrowed from the Museo di Storia Naturale, Milano, Italia (MSN). The study of the collections of MNHN was supported by a "Germaine Cousin" grant from the Société Entomologique de France.

Some specimens where dissected to study genitalia. Nomenclature of structures of internal sac follows Velázquez de Castro *et al*. (2007).

Results

Sitona bicolor Fåhraeus, 1840

HOLOTYPE: Dalamatia S. bicolor Fåhr / TYPUS / coll. Chevrol / "illegible", Dalmat? (NRM) (fig. 1).

The study of the type revealed that *Sitona bicolor* does not have an excavated frons. The specimens attributed until now to *S. bicolor* must thus correspond to *Sitona concavirostris*.

DESCRIPTION. Fig. 1- 8.
Description of type (♂). Long 3,6 mm, maximum width of elytra 1,4 mm. Black, antennae reddish brown, tibiae and tarsi ferruginous, femora darker. **Rostrum** short, 1,5 as wide as long, with subparallel sides, deeply punctured, median sulcus well marked, with lateral carina weakly marked and somewhat convergent towards the median sulcus between eyes, epistoma triangular, punctured and coarsely depressed, median carina weak. **Antennae** reddish brown, scape straight at base and gradually thicker towards apex, first desmomere twice as big as second, second desmomere 1,3 x longer that third, others subconical, as long as wide, except the seventh wider than long; club oval, short, hairy. **Head** slightly wider than long with big and deep punctures, covered by short ochre setae, and suboval greenish scales, mixed with copper-golden scales. Frons flat, rugosely punctured, with narrow median sulcus, deep between eyes, weak to vertex, narrower between eyes than between antennal insertion; scales same as on head. **Eyes** round, weakly convex, convergent toward apex, symmetrical, vertex slightly higher than dorsal plane, ocular cilia short. Width of head including eyes slightly bigger than anterior border of prothorax. **Prothorax** 1,13 x broader than long, subquadrate, rounded at sides, broadest at middle, slightly narrowed at apex, doubly contracted before anterior edge. Dorsal surface with median line slightly depressed, double punctured, with big deep punctures mixed with small shallow punctures, covered by ochre setae confluent towards the median line, golden scales sub-rounded, forming a narrow line in median depression, and silvery scales at dorsal sides. **Elytra** 1,70 x longer as wide, subparallel sided, broadest behind middle, convex, humeral callus evident, strial punctuation coarse and deep at base, progressively narrowed toward apex, interstriae flat, covered by light brown short semi recumbent setae, as long as half the width of interestriae, and subrounded scales, golden brown at dorsum and green-silver, more dense laterally and on posterior declivity. **Legs** with femora clavate dark brown, covered by sparse pubescence, medially with ring of golden green scales, tibiae ferruginous, pubescent, fore tibiae almost straight, bent inwards in apical third, first tarsomere triangular 1,5 x as long as wide, second as long as wide, third 1,5 x longer than second, strongly bilobed; onychium robust, clavate; claws curved. Ventral surface covered entirely by silvery oval scales and golden brown setae double long as scales.

GENITALIA: Genitalia could not be extracted from the type specimen, therefore those extracted from the specimens collected in Israel were studied. Male genitalia: Aedeagus with subtruncate apex (fig. 4). Internal sac with short, shell-like hamuli, long pinnae, forming lamina with basal manubrium (fig. 5). Female genitalia: 8th female sternite with wide lamina and spiculum ventrale almost as long as lamina (fig. 6). Spermatheca with long and narrow cornu (fig. 7).

DISTRIBUTION: It is likely that the distribution of *S. bicolor* encompasses the area between the Balkan Peninsula and Uzbekistan. It is widely sympatric with *S. concavirostris*, which distributes in the East Mediterranean, Caucasus, and South Russia.

STUDIED MATERIAL
Balkan Peninsula: Dalmatia (Typus)
Israel: Senir river [Hermon River] (near Field School) 26.x.1987, G. Coulon (1♂; TAUI); Qiryat Shemona, 28.v.2003, A. Freidberg (1♂; TAUI); Kefar Szold, 13.v.1973, D. Furth (1♂; 2♀; TAUI); Kefar Blum 4.v.1955, *Medicago* (1♂; TAUI); Ne`ot Mordekhay, 14.vii.2004, L. Zarabi, V. Chikatunov, pheromone trap (1♀; TAUI); Gadot, 12.v.1973, D. Furth (1♀; TAUI); Mahanayim, 17.xi.1973, D. Furth (2♂, 3♀; TAUI; 2 ♂ CVC); Lohame haGetaot [Lochmei hagetaot], 16.i.1951, Plaut, Div. Plant Prot. Dept. Agr. Israel, on *Vicia* [on Bakia] (1♀; TAUI); Nahal Tavor, south facing slope, 26.iii.2002, L. Friedman (1♂; TAUI); Nahal Barqan 29.iv.1997, R. Hoffman (2 ex.); Hammat Gader 7.v.1997, A. Friedberg (1♂; CVC; 1♂; TAUI), 8.v.1997, L.Friedman (1♂; TAUI); 'En Harod, 22.v.1938, on *Trifolium* (1♀; TAUI) (label written in Hebrew); Jordan Valley, Tirat-Zevi, vi.1998 D. Shahack (1♂; TAUI); Ma'ale Gilboa', 26.vii.1982, Q. Argaman (1♀; TAUI); Ilanot, 24.iv.1981, Q. Argaman (2♂, 2♀; TAUI); Nahal Alexander, 23.ii.1996, R.Hoffman (1 ♂. TAUI); Netanya, 19.v.1974, D. Furth (1♀; TAUI); Zur Natan, 26. viii.1981, Q. Argaman (1♂, 1♀; TAUI); Herzliyya, 18.xii.2000, A. Freidberg & L. Friedman (1♀; TAUI); Ga'ash, 7.XII.2001, A. Gazith & D. Milstein (1♂, 1♀; TAUI, 1♀ CVC); Petah Tiqwa [Petach Tikwah, Palestine], 20.ii.1949, H. Bytinski-Salz (1♂; TAUI); Holon, 7.xii.2001, A. Gazith & D. Milstein (1♀; TAUI); Bet Dagan, 28.v.1959, on *Cicer pinnatifidum* (label written in Hebrew); Qiryat Gat, 22.iv.1962 Hebr. Univ. Katznelson (1♂; TAUI); 'En Gedi, 14.v.75 (2♂, 2♀; TAUI).
Turkey: Cappadocia, Mustafapaşa near Ürgüp, 8.v.2000, 1000 m, A. Freidberg, H. Ackerman & L. Friedman (6♂, 3♀; TAUI 2♂, 1 ♀ CVC).
Uzbekistan: Samarkand 1 ♂, 1 ♀. Reitter labelled as *S. molitor* Fst. / (col. Tournier) (MNHN) .

SPECIES REMOVED FROM SYNONYMY: *S. burlinii* corresponds to *S. humeralis* (**syn. nov**.). The type of *S. burlinii* is an immature specimen, labelled as following: Sitona Burlinii m. holotypus! det F. Solari/ Duino Trieste Burlini 30. 5. 37. (MSN).

NEW SYNONYMIES:
Sitona concavirostris = *Sitona bicolor* auctt.

COMPARATIVE NOTES
S. bicolor belongs to the group of species with narrow frons and proacetabuli far from prosternal line. This group was named Angustifrontes by Reitter (1903). Although it is probably paraphyletic, we will use it, as at the moment there is no any grouping of the subgenera within *Sitona*. Within Angustifrontes there are some species with concave frons, such as *Sitona discoideus*, *S. humeralis* or *S. concavirostris*. *S. bicolor* can be distinguished from these species by the shape of its frons, but it is very similar to them in its habitus, the punctuation of pronotum, and in the sclerites of the internal sac; all these species have rounded hamuli. Therefore, these four species can still be considered as the *Sitona humeralis* group.

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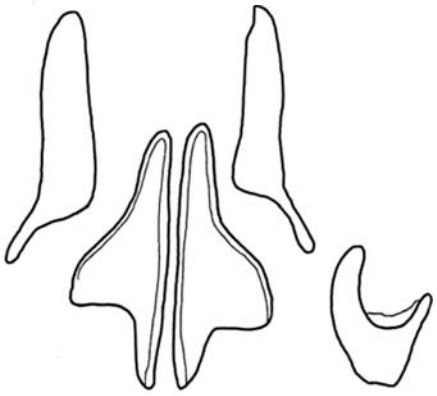

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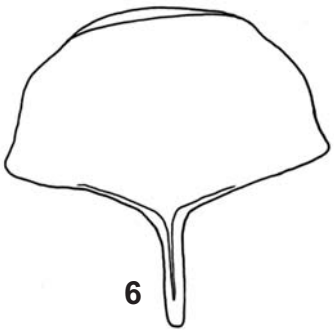

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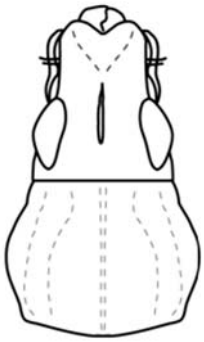

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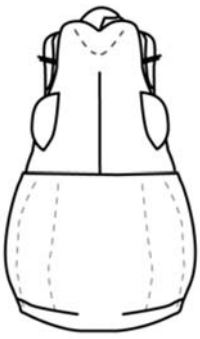

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Fig. 1. Labels of the Type specimen. **Fig. 2.** Anterior part of *S. bicolor*. **Fig. 3.** Habitus of *S. bicolor*. **Fig. 4.** Aedeagus of *S. bicolor*. **Fig. 5.** Pieces of internal sac of *S. bicolor*. **Fig. 6.** 8th female sternite of *S. bicolor*. **Fig. 7.** Spermatheca of *S. bicolor*. **Fig. 8.** Head and prothorax of *S. bicolor*. **Fig. 9.** Head and prothorax of *S. concavirostris*.

The other species of Angustifrontes have a flat frons. Some of them can be easily distinguished from *S. bicolor* by the gross punctuation in the pronotum and different habitus. Other are more similar to *S. bicolor*, but differ from it in the form of the hamuli: they can be baculus-like, as in *S. cylindricollis* Fahraeus, 1840, *S. cornutus* Velázquez de Castro, 2009 and *S. brucki* Allard, 1870, or bifurcate and elongate, as in *S. amurensis* Faust, 1882.

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