

TAXONOMIC NOTES ON STRONGYLOGASTERINI
(HYMENOPTERA: TENTHREDINIDAE)

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Abstract.—The western Palaearctic members of the *Strongylogaster multifasciata* group, *S. multifasciata* (Geoffroy 1785) and *S. xanthocera* (Stephens 1835), are keyed, and the status of the included nominal taxa is discussed in view of taxonomical and zoogeographical aspects. Lectotypes are designated for *Strongylogaster desbrochersi* Konow 1892 and *S. desbrochersi* var. *lepticus* Konow 1902, which are **new synonyms** of *S. xanthocera* (Stephens 1835). *Strongylogaster lineata cypria* Benson 1954 is a **new synonym** of *S. multifasciata*. The striking morphological variability among West Palaearctic *S. xanthocera* is caused by the polycentric, both Mediterranean and Eurosiberian, origin of the population. *Hemitaxonus* Ashmead 1898 is proposed as a **new synonym** of *Thrinax* Konow 1885, and 22 of 23 species involved are **new combinations** with *Thrinax*.

Key Words: *Strongylogaster*, *Hemitaxonus*, *Thrinax*, Selandriinae

Strongylogaster, a genus of Selandriinae (Tenthredinidae), is represented in the Holarctic region by some 40 species. The larvae are external feeders on ferns. The members of the *S. multifasciata*-group share the distally widened and elongate valvulae 3 of the ovipositor sheath as an apomorphy. Naito (1996) considered six species of this group, two of which, *S. multifasciata* (Geoffroy) and *S. xanthocera* (Stephens), are distributed also in the western Palaearctic. In Europe and northern Africa, adults and larvae of these species sometimes occur numerously on the fronds of the fern named bracken (*Pteridium aquilinum* (L.) Kuhn). This fern, a cosmopolitan pest of pastures, is poisonous to grazers and often harmful to the autochthonous plant cover. It is one, in the Mediterranean possibly the main, larval host of *S. multifasciata* and *S. xanthocera* (see Taeger et al. 1998 for list of hosts).

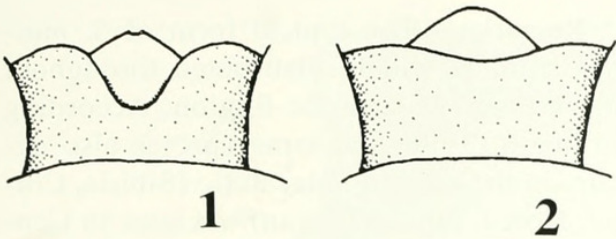
Throughout the Mediterranean area *S.*

multifasciata and *S. xanthocera* seem to produce local forms, and several of them have been named in the past. The present taxonomic results partly contradict Naito's (1996) concept. A key for the *S. multifasciata*-group in the West Palaearctic realm is presented because the published keys (Naito 1996, Blank 1998) are not appropriate for the identification of males and of North African specimens. Zoogeographical aspects are discussed to construe morphological variability.

The second part of this work treats the proper use of the name *Thrinax*, which was so far applied either for a subdivision of *Strongylogaster* or for a separate genus close to *Strongylogaster*.

MATERIAL AND METHODS

The following abbreviations are used for museum collections: DEI = Deutsches Entomologisches Institut, Eberswalde, Germany; MCSN = Museo Civico de Storia



Figs. 1–2. Female hypopygium. 1, *Strongylogaster multifasciata*. 2, *S. xanthocera*.

Naturale “Giacomo Doria”, Genoa, Italy; MZLU = Museum of Zoology, Lund University, Sweden; NHM = The Natural History Museum, London, Great Britain; ZSM = Zoologische Staatssammlung, München, Germany.

Before dissection, the male genitalia were treated with 3% potassium hydroxide solution for 6–8 hours at ca 50°C to dissolve tissue from chitinous structures, and then rinsed with water. The dissected penis valve was mounted in glycerine for photographing. Digital photographs were taken with a Olympus C-3030 camera and processed with PhotoImpact 4.2 and CorelDRAW 9. In the list of *Thrinax* species, the occurrence of each species in a zoogeographical region is indicated by [WP] for West Palaearctic, [EP] for East Palaearctic, [N] for Nearctic, and [O] for Oriental.

KEY TO WESTERN PALAEARCTIC SPECIES OF THE *STRONGYLOGASTER MULTIFASCIATA* GROUP

- 1. Female 2
- Male 3
- 2(1). Appendix of hypopygium hardly protruding beyond distal margin of hypopygium, basally with a deep depression confined by a distinct raised edge (Fig. 1). Pterostigma usually dark brown anteriorly and pale brown posteriorly. Antenna black, usually scape, pedicel and ventral side of antennomere 3 red
 Strongylogaster multifasciata (Geoffroy 1785)
- Appendix of hypopygium distinctly protruding beyond distal margin of hypopygium, without basal depression or distinct edge (Fig. 2). In European specimens, usually antennomeres 1–4(–9) red and pterostigma unicolorous pale, in North African specimens antenna mostly black and pterostigma dark brown
 *Strongylogaster xanthocera* (Stephens 1835)

- 3(1). Valviceps 1.85–2.05 times longer than wide, dorsal and ventral edge almost straight, distally with an almost straight dorso-distal and ventro-distal outline, medial sclerotization clearly extending up to distal edge of valviceps (Figs. 3–4). Pterostigma usually anteriorly dark brown and posteriorly pale brown. Fore and hind coxae pale except for a narrow line along base. Abdominal segments 3–9 (always?) without black pattern
 *Strongylogaster multifasciata* (Geoffroy 1785)
- Valviceps 1.55–1.70 times longer than wide, ventral edge sinuate, distal edge evenly rounded, medial sclerotization distally fading and not clearly extending up to distal edge of valviceps (Figs. 5–8). Pterostigma unicolorous brown to piceous, seldom bicolorous. Fore coxa with black line along base about as wide as ocellar diameter, hind coxa predominantly black at least laterally. Abdominal segments 4–9 red, in central and northern European specimens, anteriorly more or less black on segments 4–9
 *Strongylogaster xanthocera* (Stephens 1835)

Strongylogaster Dahlbom 1835

- Strongylogaster* Dahlbom 1835: 4, 13. Type species: *Tenthredo multifasciata* Geoffroy 1785, subsequent designation under the plenary power (ICZN 2000: Opinion 1953; see Blank et al. 1999)
- Pseudotaxonus* A. Costa 1894: 157. Type species: *Tenthredo (Allantus) filicis* Klug 1817, by monotypy. Synonymy by Ross (1937)
- Polystichophagus* Ashmead 1898: 310. Type species: *Tenthredo (Allantus) filicis* Klug 1817, by monotypy. Synonymy by Enslin (1913)
- Prototaxonus* Rohwer 1910c: 49. Type species: *Prototaxonus typicus* Rohwer 1910 [= *Strongylogaster tibialis* Cresson 1880], by original designation. Synonymy by Ross (1937)
- Thrinax* auct. nec Konow 1885; = *Strongylogaster* subgen. *Thrinax* auct.
- Strongylogaster multifasciata* (Geoffroy 1785)
 (Figs. 1, 3, 4)
- Tenthredo* spec. Geoffroy 1762: 278, Nr. 14, ♀.
- Tenthredo multi-fasciata* [recte: *multifas-*

ciata] Geoffroy in Fourcroy 1785: 368, Nr. 14, ♀, type locality: France, Paris.

Tenthredo lineata Christ 1791: 450, ♀, type locality: ?; = *Strongylogaster lineata* (Christ 1791). Synonymy by Blank (1998).

Tenthredo alternans Serville 1823: 17, ♀, type locality: France, environs of Paris. Synonymy by Dalla Torre (1894).

Tenthredo alternans Lepeletier 1823: 73, ♀, type locality: France, environs of Paris. Synonymy by Dalla Torre (1894).

Tenthredo (Allantus) linearis Klug 1817: 217–218, ♂, type locality: Austria, Carinthia, preoccupied in *Tenthredo* by Schrank 1781: 343. Synonymy by Hartig (1837) and Dalla Torre (1894).

Strongylogaster cretensis Konow, 1887: 26, ♀ ♂, type locality: Greece, Crete. Synonymy by Naito (1996).

Strongylogaster lineata cypria Benson 1954: 276, ♀, type locality: Cyprus, near Platania Forest Station. **New synonym.**

Tenthredo cingulata auct. nec Fabricius 1793. See Blank et al. (1999).

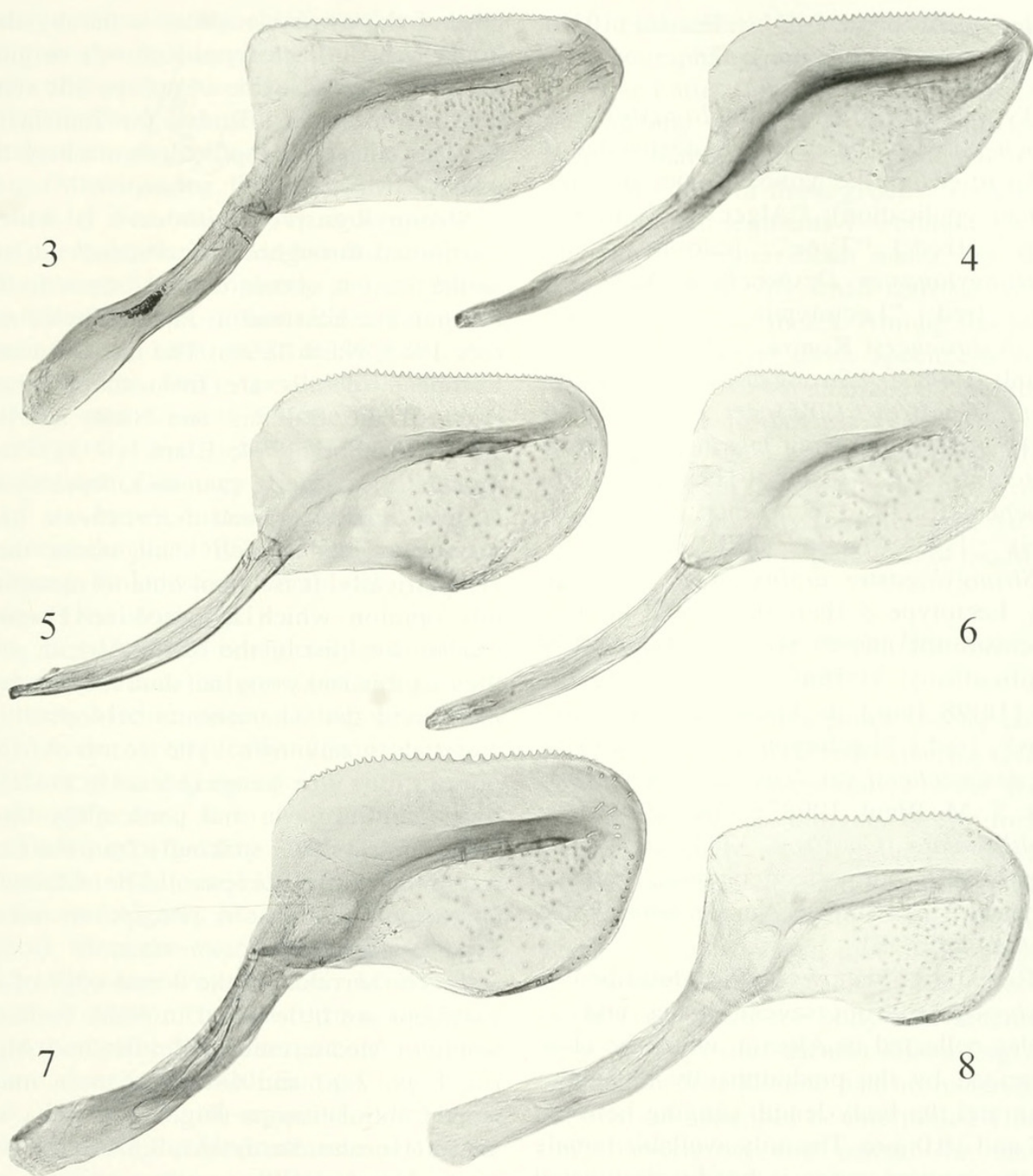
Type material.—*Strongylogaster cretensis*. Lectotype ♂ (designated by Schedl 1981): “Creta”; “Coll. Konow”; [red:] “Typus”; [label with red margin:] “Lectotypus *Strongylogaster cretensis* Konow ♀”; “*Strongylogaster multifasciata* (Geoffroy, 1785) det. S. M. Blank 2001”. Both antennal flagella and parts of the left fore wing and of the legs missing. Paralectotype: 1 ♂ from Crete, in poor condition. DEI.

Strongylogaster lineata cypria. Holotype ♀: [round label with red edge:] “Type”; “Cyprus Nr. Platania Forest Stn. 2,500–4,000’ 7.v.1945 G. A. Mavromoustakis”; “near Platania Forest Station 3,500–4,000 ft 7.5.45”; “Holotype *Strongylogaster lineata cypria* subsp. n. det. ♀ R.B. Benson 1953”; “B.M. Type Hym. 1.677”; “*Strongylogaster multifasciata* (Geoffroy, 1785) det. S. M. Blank 2001”. In perfect condition. Paratypes: 5 ♀, only 1 ♀ checked from “Lebanon, Falouka, 17.v.1953”, leg. Mavromoustakis. NHM.

Remarks.—The typical form of *S. multifasciata* is widely distributed throughout the western Palaearctic Region. According to Naito (1996) the same species also occurs in the eastern Palaearctic (Siberia, China, Korea, Japan, Taiwan). At least in Central Europe males are comparatively rare, and possibly part of the population reproduces parthenogenetically. *Strongylogaster cretensis* is a valid species according to Schedl (1981), who checked the types and designated a lectotype. Naito (1996) synonymized *S. cretensis* with *S. lineata* (= *S. multifasciata*). The hypopygium of the female lectotype agrees with *S. multifasciata*. In both males and females the abdomen is red except for tergum 1 and more or less tergum 2, and the legs are predominantly red. Such specimens are only known from western Crete (Schedl 1981, 1993) and form an allopatric local population of *S. multifasciata* (see Naito 1996).

The form *S. lineata cypria* described by Benson (1954) for material from Cyprus and Lebanon has entirely pale hind femora and completely black basal antennal segments. It agrees well with the concept of *S. multifasciata* in the shape of the hypopygium and the bicolourous pterostigma. The name Falonka given by Benson is a type error for the Lebanese collecting locality Falouka (= Falugha, Falougha). Naito (1996) omitted *cypria*, which is hereby treated as a synonym with *multifasciata*.

The subapical claw is usually larger in *S. xanthocera* than in *S. multifasciata*, but this character underlies considerable variability. The following characters, which were applied by former authors (see e.g., Muche 1969, Naito 1996), are according to my experience not diagnostic for the separation of the two species: front lobe of mesonotum with/without coarse punctures, density of macro- and microsculpture on other parts of the thorax; relative length of antennal segments; shape of underside of sawsheath near base. The geographic variability of further characters will be discussed under *S. xanthocera* below.



Figs. 3–8. Geographic variability of penis valve. 3, *Strongylogaster multifasciata* from Germany, Lower Bavaria, Bärmannsried. 4, *S. multifasciata* from Greece, Crete, Khaniá. 5, *S. xanthocera* from Germany, Berlin-Friedrichshagen. 6, *S. xanthocera* from Japan, Honshu, Sasayama. 7, *S. xanthocera* from Algeria, Theniet el Had. 8, *S. xanthocera* from Tunisia, Nafzah.

Strongylogaster xanthocera
(Stephens 1835)
(Figs. 2, 5–8)

Tenthredo xanthocera Stephens 1835: 337,
♀ ♂, type locality: England, environs of
London.
Strongylogaster geniculata C. G. Thomson
1871: 243, ♀, type locality: Sweden, Ån-

germanland and Skåne. Synonymy by
Konow (1905).

Strongylogaster desbrochersi Konow 1892:
214–214, ♀ ♂, type locality: Algeria,
Theniet el Had. **New synonym.**

Strongylogaster desbrochersi var. *lepticus*
Konow 1902: 390, ♀ ♂, type locality:
Tunisia, Aïn Draham; *Strongylogaster*

desbrochersi var. *lepidus*: Forsius (1930), type error. **New synonym.**

Type material.—*Strongylogaster desbrochersi*. Lectotype ♀ (here designated in order to ensure the name's proper and consistent application): "Alger."; "Coll. Konow"; [red:] "Type"; [cabinet label:] "*Strongylogaster Desbrochersi* Knw. Alger."; [red:] "Lectotypus ♀ *Strongylogaster desbrochersi* Konow, 1892 des. S. M. Blank 1998"; "*Strongylogaster multifasciata* (Geoffroy, 1785) det. S. M. Blank 2001". Head and front legs missing. Paralectotypes: 1 ♂ "Teniet-el-Hâad [leg.] Desbrochers 1889"; 1 ♂ "Teniet el Haad Algeria"; 1 ♂ "Algeria". DEI.

Strongylogaster desbrochersi var. *lepticus*. Lectotype ♂ (here designated in order to ensure the name's proper and consistent application): "Tunisie Aïn Draham, 4.5.[18]98 [leg.] de Gaulle"; "Coll. Konow"; [red:] "Lectotypus ♂ *Strongylogaster desbrochersi* var. *lepticus* Konow, 1902 des. S. M. Blank 1998"; "*Strongylogaster multifasciata* (Geoffroy, 1785) det. S. M. Blank 2001". In perfect condition. Paralectotypes: 2 ♂ "Tunisie Aïn Draham, 9.5.98 de Gaulle". DEI.

Remarks.—Konow (1892) described *S. desbrochersi* from several males and females collected in Algeria, which he characterized by the predominantly red abdomen and the body length ranging between 7.5 and 10.0 mm. The only available female of the syntype series is hereby designated as the lectotype. Naito (1996) synonymized *S. desbrochersi* and *S. lineata* (= *S. multifasciata*). This is incorrect because the hypopygium of the *S. desbrochersi* lectotype is similar to *S. xanthocera* (Fig. 2) and not to *S. multifasciata*.

Konow (1902) described *Strongylogaster desbrochersi* var. *lepticus* from Tunisia due to the more or less darkened abdomen and legs. Naito (1996) omitted *lepticus*, but Lacourt (1999) listed it in synonymy with *S. multifasciata*. The female syntype(s), mentioned in the original description, are lost.

One of the available males is hereby designated as the lectotype. Konow's original name is deemed to be of subspecific rank, because he stated "Tunis" (= Tunisia) as the particular geographical area where the material was collected.

Strongylogaster xanthocera is widely distributed throughout the Palaearctic, and in the East it occurs among others in the Russian Far East and in Japan (Zhelochovtsev 1988, Naito 1996). The most southern European records are from the southern parts of the Balkans and Sicily (Hellén 1967, Zombori 1994, Blank 1993). From Tunisia and Algeria two taxa, *lepticus* (= *lepidus*, type error) and *desbrochersi*, have been described which shall occur there sympatrically. It is impossible to reconfirm this opinion which is based on Forsius' (1930) checklist of the North African sawflies, as this lacks original data for his statement, and the whereabouts of concerning material is unknown. The North African populations are geographically isolated from the European and particularly those from Tunisia differ strikingly from the Central and North European. The following character variability is perceptible among West Palaearctic *S. xanthocera*:

1. The serrulae on the dorsal edge of the valviceps are little larger in males from the southern Mediterranean (Tunisia and Algeria; Figs. 7–8) and Greece than in males from Central Europe (Fig. 5), Corsica and Japan (Honshu, Sasayama, 3.5.1963, leg. T. Naito, Fig. 6; DEI).

2. Tunisian specimens (♀ 6.5–7.5 mm, ♂ 5.5–7.0 mm) are smaller than Algerian (♀ ca 9.0 mm, ♂ 7.5–8.5 mm), specimens from Bulgaria, Corsica, Greece, Sicily, Central and North Europe, and Japan are the largest (♀ 9.5–11.5 mm, ♂ 7.5–10 mm).

3. Southern Mediterranean specimens tend to have a dark pterostigma, whereas the pterostigma is pale in northern Mediterranean, Central and North European and Japanese specimens.

4. The amount of pale color on the fe-

male antenna increases in northern direction: in the females from Tunisia and Algeria the antenna is black and rarely little pale on scape and pedicel; a female from Sicily with scape and pedicel distally little pale (Messina, leg. F. Vitale, MCSN; reported by Zombori [1984] as *S. desbrochersi*); a Bulgarian female has the scape distally, the pedicel completely and antennomere 3 basally red (southern Pirin mountains, Popina Laka, 1,000 m, 14.6.1989, leg. Zerche & Behne, DEI); females from Greece, Corsica and Central Europe have antennomeres 1–4 red; in many females from northeastern Germany the distal antennomeres are brown instead of black (Berlin-Friedrichshagen; DEI); three females from southern Finland have completely pale antennae (Karislojo; DEI).

5. Females with completely red abdominal segments 4–10 were observed in the southern Mediterranean realm, where they may occur syntopically (Tunisia; Blank 2002) or at least sympatrically with the predominantly dark form (red form *S. desbrochersi*, type locality: Teniet el Hâad [= Theniet el Had] ca 135 km SW Algiers; dark form: Algeria, Massif des Mouzaïa [= Djebel Mouzaïa ca 50 km SW Algiers], 14.5.1936, leg. Peyerimhoff, MCSN, see Zombori 1984). The red form is unknown from the northern Mediterranean realm and from Central and North Europe.

6. The abdominal segments 4–9 are red in males from the Mediterranean realm, but the anterior portions of segments 4–9 are extensively darkened towards the abdominal tip in Central European and Japanese males.

The geographic pattern of these characters matches a polycentric species, which had its refugia in the Mediterranean and in eastern Asia during the glacial times. The strains characterized above do not cover the feature of *lepticus*, *desbrochersi* and *xanthocera* as recognized prior to Naito (1996). The abdominal coloration in males and the size of the dorsal serrulae of the valvaceps roughly distinguishes the populations with

Mediterranean and Eurosiberian origin (zoogeographic terminology in accordance with de Latin 1967). I shall abstain from ranking any of them at subspecific level, because males from Corse cannot be classified to either of these groups. They have the abdominal segments 4–9 completely red like other Mediterranean males, but their valvaceps bears only small serrulae like in Central European males. Among the Mediterranean material those specimens from North Africa are characterized by their dark pterostigma and smaller body size. The other characters seem either to follow a (climatic?) gradient (antennal color in females) or to occur arbitrarily (females with red abdomen within local populations of the Mediterranean region).

NOMENCLATURAL NOTES ON *HEMITAXONUS* AND *THRINAX*

The species of this genus chiefly occur in East Asia and in North America (Naito 1971). The only representative of the Western Palaearctic, *T. contigua*, is rare in Europe and usually misinterpreted in the European faunistic literature. Konow (1885) described *T. "contigua m. (= mixta [sensu] Thoms.)"* and repeated part of the characters, which Thomson (1871) listed for *T. mixta* (i.e., length of body and antennae, shape of ovipositor sheath). Accordingly, it is apparent that Konow had no material of his own on hand, but he interpreted Thomson's description and named the taxon. Type material is not present in Konow's collection (coll. DEI). The specimen, which Malaise (1933) cited as "Thomson's type", is the lectotype of *T. contigua* (type locality: northern Sweden; cf. Blank 1998). Malaise (1933) identified this specimen as "*struthiopteridis* Fors." [= *Sahlbergia struthiopteridis* Forsius, 1910]. *S. struthiopteridis* has widely been accepted as a member of *Hemitaxonus* (e.g., Enslin 1914, Zhelochovtsev 1951, Naito 1971). Consequently, the name *Thrinax* is a senior synonym of *Hemitaxonus* and not available for a subdivision of *Strongylogaster* s.l. as it

was understood by most authors so far. It should be pointed out that Zhelochovtsev (1988) has already combined the name *Thrinax* with *struthiopteridis* Forsius, but without giving an explanation. The change of generic name involves the following taxa:

Thrinax Konow 1885

- Thrinax* Konow 1885: 19, 22–23. Type species: *Thrinax contigua* Konow 1885 [= *Sahlbergia struthiopteridis* Forsius 1910], subsequent designation by MacGillivray (1908), = *Strongylogaster* (*Thrinax*)
- = *Hemitaxonus* Ashmead 1898: 311. Type species: *Taxonus dubitatus* Norton 1868, by original designation. **New synonym.**
- = *Epitaxonus* MacGillivray 1908: 365–366. Type species: *Taxonus albidopictus* Norton 1869, by original designation. Synonymy by Rohwer (1911)
- = *Sahlbergia* Forsius 1910: 49–50. Type species: *Sahlbergia struthiopteridis* Forsius 1910, designation by monotypy. = *Sahlberghia*, type error. Synonymy by Enslin (1913)
- = *Canonarea* Malaise 1947: 37–38. Type species: *Canonarea albooralis* Malaise 1947, by original designation. Synonymy by Naito (1990)
- = *Trearea* Malaise 1947: 2, 35–36. Type species: *Trearea compressicornis* Malaise 1947, by original designation. Synonymy by Naito (1990)
- Thrinax albidopicta* (Norton 1868), **n. comb.** [N]; = *Taxonus albido-pictus* Norton 1868 [nec 1869]; = *Taxonus amicus* Norton 1868 [nec 1869]; = *Hemitaxonus rufopectus* Rohwer 1910b: 204
- Thrinax albooralis* (Malaise 1947), **n. comb.** [O]; = *Canonarea albooralis* Malaise 1947: 38
- Thrinax angustata* (Zhelochovtsev 1951), **n. comb.** [EP]; = *Hemitaxonus angustatus* Zhelochovtsev 1951: 145–146
- Thrinax athyrii* (Naito 1971), **n. comb.** [EP]; = *Hemitaxonus athyrii* Naito 1971: 20–21, 26–27
- Thrinax compressicornis* (Malaise 1947), **n. comb.** [O]; = *Trearea compressicornis* Malaise 1947: 36
- Thrinax contigua* Konow 1885 [WP, EP]; = *Hemitaxonus contigua* (Konow 1885); = *Sahlbergia struthiopteridis* Forsius 1910: 50–51
- Thrinax dubitata* (Norton 1862), **n. comb.** [N]; = *Taxonus dubitatus* Norton 1862: 119
- Thrinax flexa* (Lee & Ryu 1996), **n. comb.** [EP]; = *Hemitaxonus flexus* Lee & Ryu 1996
- Thrinax formosana* (Takeuchi 1928), **n. comb.** [EP]; = *Hemitaxonus formosanus* Takeuchi 1928: 43
- Thrinax goniata* (Wei 1997), **n. comb.** [EP or O]; = *Hemitaxonus goniatus* Wei 1997: 1575–1576, 1606–1607
- Thrinax japonica* (Rohwer 1910), **n. comb.** [EP]; = *Hemitaxonus japonicus* Rohwer 1910a: 112
- Thrinax kamtchatica* (Malaise 1931), **n. comb.** [EP]; = *Hemitaxonus kamtchaticus* Malaise 1931: 22
- Thrinax melanogyne* (Naito 1971), **n. comb.** [EP]; = *Hemitaxonus melanogyne* Naito 1971: 20, 22–23
- Thrinax minomensis* (Takeuchi 1929), **n. comb.** [EP]; = *Hemitaxonus minomensis* Takeuchi 1929: 511–512
- Thrinax multicincta* (Hall 1918), **n. comb.** [N]; = *Hemitaxonus multicinctus* Hall 1918 [nec Rohwer, nec 1917]: 28
- Thrinax nigrooralis* (Malaise 1947), **n. comb.** [O]; = *Canonarea nigrooralis* Malaise 1947: 39
- Thrinax paucipunctata* (Malaise 1931), **n. comb.** [EP]; = *Hemitaxonus paucipunctatus* Malaise 1931: 139–140
- Thrinax primaria* (D. R. Smith 1966), **n. comb.** [N]; = *Hemitaxonus primarius* D. R. Smith 1966: 114, 119–120
- Thrinax rufoclypeus* (Wei 1998), **n. comb.** [EP]; = *Hemitaxonus rufoclypeus* Wei in Nie & Wei 1998: 126
- Thrinax sasayamensis* (Okutani 1954), **n. comb.** [EP]; = *Hemitaxonus sasayamensis* Okutani 1954: 76–77

Thrinax takeuchii (Naito 1971), **n. comb.** [EP]; *Hemitaxonus takeuchii* Naito, 1971: 20–21, 27–28

Thrinax tokunagai (Takeuchi 1941), **n. comb.** [EP]; *Hemitaxonus tokunagai* Takeuchi 1941: 248–249

Thrinax weni (Wei 1998), **n. comb.** [EP]; = *Canonarea weni* Wei in Nie & Wei 1998: 125–126

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