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8. The South and Central African Species of the Genus *Synagris* Latreille (Hymenoptera)

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Richard P. Dow

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8. *The South and Central African Species of the Genus Synagris Latreille (Hymenoptera).*—By J. BEQUAERT.

THIS is the first of a series of articles in which I shall deal with the diplopterous wasps of South and Central Africa, south of 10° S. lat. The area under consideration includes the south-eastern portion of the Belgian Congo, or the Katanga district, which in its fauna and flora has many points in common with Northern Rhodesia, and differs considerably from the equatorial Congo belt. Since for lack of material the wasps of the Katanga could not be fully treated before, the present paper will supplement my Revision of Congo Vespidae (1918).

The genus *Synagris* contains the largest and most handsome of the African wasps, and is unquestionably one of the striking features of the Ethiopian fauna. Many of its members are common, and their presence is forced upon the attention of the traveller by the conspicuous large mud-nests they build, often in colonies, and frequently within human habitations. An account of the characters and interesting behaviour of the genus will be found in my paper quoted above. The majority of the twenty-four species recognised at present occur in Western and Equatorial Africa. In the region here considered, seven species are known with certainty, of which but five occur south of the Zambesi River. *Synagris maxillosa* and *S. carinata* are apparently restricted to South Africa. The genus seems to be absent from the immediate vicinity of Cape Town, the westernmost record known in the Cape Province being Tulbagh.

Since Maidl has exhaustively treated this genus in a comparatively recent monograph (1914), it will suffice here to give a key enabling the identification of the South and Central African species. The females possess 12 antennal joints and 6 visible abdominal segments; the males 13 antennal joints and 7 abdominal segments. In addition the males frequently exhibit a number of secondary sexual characters on the mandibles, head, clypeus, legs, and 2nd abdominal segment; though the size and shape of these sexual peculiarities vary considerably, even within the limits of one species, they are in themselves good specific characters.

Hymenoptera - Vespidae - Eumeninae

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1923

I have called attention elsewhere (1918, pp. 124-127) to the extensive variation shown in the colour markings of certain species in this genus and to the resulting impossibility of correctly identifying specimens without a careful study of structural characters. Some of the species include a number of more or less constant colour races or varieties, while the same colour-pattern may be repeated in different species. Many of the forms, especially in the subgenus *Paragris*, are either almost wholly black, or black with white or orange-red apical segments. Furthermore, a similar colouration is also found in some of the larger forms of *Odynerus*, subgenus *Rygchium*, which, however, differs in having 6-jointed maxillary palpi and 4-jointed labial palpi. In *Synagris* the labial palpi are always 3-jointed and the maxillary palpi 3- to 5-jointed, except in *S. vicaria* where they are 6-jointed.

The length is measured from the centre of the clypeus to the apical margin of the 2nd abdominal tergite (h.+th.+t. 1+2).

Table of Subgenera.

1. Clypeus pear-shaped, with 2 conspicuous, longitudinal keels on apical $\frac{2}{3}$. Mandibles comparatively short, strongly grooved and keeled on external face; inner margin with only 3 slight notches. Postscutellum feebly raised, not hunched. Propodeum without strong, lateral spines, its lateral and inferior ridges irregularly serrulate Subgenus *Pseudagris*.
Clypeus without longitudinal keels, at most with traces of two very short ridges near apex 2.
2. Maxillary palpi 6-jointed; labial palpi 3-jointed, but joints very long and thickened. Vertex without hairy fovea. Mandibles and postscutellum as in *Pseudagris*. Propodeum rounded at sides, without spines or ridges, not serrulate. In the male, apical joint of antennae very short, hardly curved, and not folded beneath penultimate joint Subgenus *Rhynchagris*.
Maxillary palpi never more than 5-jointed, often less; labial palpi with 3 slender joints. Postscutellum bidentate or with two rounded protuberances. Propodeum as a rule with lateral spines. In the male, apical joint of antennae folded like a hook beneath preceding joints 3.
3. Mandibles more or less grooved or keeled on outer surface; their inner margin in the female with 3 notches, in the male with teeth of variable size and shape; very rarely the mandibles of the male have protuberances near their base (*S. negusi*). Vertex as a rule with hairy fovea. Postscutellum with 2 somewhat spiny protuberances Subgenus *Paragris*.
Mandibles with even, almost smooth, outer surface; inner margin finely serrulate in both sexes; in the male the mandibles frequently bear a protuberance or horn near base. Postscutellum with 2 broadly-rounded protuberances.
Synagris, sensu stricto.

SUBGENUS SYNAGRIS, sensu stricto.

This group consists of three (or possibly only two) very closely allied species, the characters of which have been compared in my Revision of the Congo Vespidae.

Synagris cornuta (Linné), the best known of these species, occurs in various colour forms throughout the West African Forest Province from Sierra Leone to Uganda and the mouth of the Congo River. In the interior of the continent, the southernmost points from which it is recorded at present are Kondué (4° 55' S., 23° 15' E.) and Kindu (3° S., 26° E.). Lepeletier de St. Fargeau's old indication of this species from the "Cape of Good Hope" is certainly erroneous.

In eastern equatorial Africa *S. proserpina* (Gribodo) replaces *S. cornuta*, from which it differs in having the second abdominal sternite more abruptly sloping on the basal third in both sexes. In the male the apical margin of the clypeus is distinctly truncate, or more or less emarginate (in *S. cornuta* narrowly or broadly rounded, or nearly truncate), and the denticulation of the inner margin of the mandibles is stronger than in *S. cornuta*, especially towards their base. *S. proserpina* agrees with *S. cornuta* in showing on the middle of the tarsal claws a broad triangular edge, in addition to the two apical teeth, a character which is not found in other members of the genus.

In the typical form of *S. proserpina*, which occurs in Tanganyika Territory (ex-German East Africa), the head, thorax, legs, and base of abdomen are entirely, or nearly entirely, brownish red; the remainder of the body is black, with interrupted white bands on the apical margins of abdominal tergites 3 to 5.

The var. *nyassae* (Stadelmann) (syn.: *Synagris flavomaculata*, Meade Waldo) differs from the type in the greater extension of the black on head, thorax, and base of abdomen; the white bands on tergites 3 to 5 are so broadly interrupted on the middle line that they form two rows of lateral spots. Length (h.+th.+t. 1+2): 18-20 mm. This form occurs from the northern end of Lake Nyasa (Manow), through North-East Rhodesia (Fort Jameson and Fwambo) to the Katanga (Lufira River at 3500 ft.; 150 to 200 miles west of Kambove at 3500 to 4500 ft.; Kapiri; and I have seen a male from Lubumbashi, May 22, 1920, and a female from the same locality, January 20, 1921, both taken by Dr. Mich. Bequaert).

It would be interesting to learn in how far the behaviour of *S. proserpina* coincides with the very peculiar habits of its ally *S. cornuta*. The life-history of the latter has been fully investigated by Roubaud

(1910 and 1916), and a résumé of his observations, together with some additional data, will be found in my Revision (1918, pp. 211-214).

SUBGENUS PARAGRIS, Saussure.

Females.

1. Clypeus pear-shaped, slightly longer than broad, covered with minute, more or less distinct, confluent longitudinal striae; its apex comparatively narrow, straight truncate or feebly sinuate. Lateral angles of propodeum forming spiny protuberances, its dorsal areas rugosely reticulate, without distinct transverse striae; the transverse striation on its concavity distinct. Second abdominal sternite feebly convex towards base, not projecting more on middle than on sides, its median line slightly depressed; portion in front of posterior margin with 2 transverse (often inconspicuous) welts. Black; clypeus, antennae, mandibles, and spots on head more or less ferruginous red; in the typical form the 3 apical segments of abdomen orange-yellow; in the var. *emarginata* (Saussure) the 4 apical segments of that colour; in the var. *albofasciata*, Maidl, the 3 apical segments ivory-white. Length (h.+th.+t. 1+2): 18-23 mm. *S. abyssinica*, Guérin.

Clypeus either smooth or with scattered punctures, without striation. Lateral angles of propodeum forming spiny protuberances. As a rule the dorsal areas of propodeum, as well as its concavity, are distinctly corrugated. Basal portion of 2nd abdominal sternite more abruptly raised in the middle than on sides, and slightly, although distinctly, flattened or even somewhat sunken behind this raised median part 2.

2. Clypeus broadly pear-shaped, with widely truncate and somewhat rounded apical margin; its apical quarter markedly depressed or even slightly sunken. Black; clypeus, antennae, mandibles, parts of head and of fore legs, more or less ferruginous red; the 3 apical tergites of abdomen and part of the corresponding sternites orange-red. Length (h.+th.+t. 1+2): 18-23 mm.

S. calida, Linné.¹

Clypeus pear-shaped and convexly swollen throughout or very narrowly flattened into a preapical margin 3.

3. Black; clypeus, a few spots on antennae, mandibles, head, and fore legs, ferruginous red; 2 or 3 apical abdominal tergites with more or less extensive white markings. Clypeus rather dull, elongate pear-shaped; its apical, narrow portion comparatively long. Length (h.+th.+t. 1+2): 19-24 mm.

S. mirabilis, Guérin.

Black, with the 4 apical tergites of the abdomen orange-red 4.

4. Clypeus rather dull, elongate pear-shaped, much longer than broad, its terminal narrowed portion constricted at the base and its apex narrow and rather abruptly truncate. Clypeus and parts of antennae and head orange or

¹ *Synagris (Paragris) calida* has been included in the keys, although it is not known with certainty from the region under study. The records of *calida* from the Cape, Natal, and Transvaal are extremely doubtful and probably based on erroneous identifications.

ferruginous red in the typical form; the clypeus black in the var. *nigroclypeata*, Maidl. Length (h.+th.+t. 1+2): 18-21 mm.

S. analis, Saussure.

Clypeus glossy, comparatively short pear-shaped, basal broad portion very gradually narrowed towards apex, which is broad and obtusely rounded. Clypeus, antennae, and a spot on the middle of the face, orange. Length (h.+th.+t. 1+2): 20 mm. *S. maxillosa*, Saussure.

Males.

1. Apical margin of clypeus deeply and distinctly emarginate, either bidentate or bifid 2.
 Apical margin of clypeus straight or round truncate, or very feebly sinuate, never bidentate. Dorsal areas of the propodeum transversely corrugated 4.
2. Black, with white markings on the 3 or 4 apical tergites of abdomen. Clypeus much broader than long, its apex very deeply and narrowly emarginate, the lateral edges forming 2 broad, blunt appendages. Mandibles with a broad basal half, then distinctly constricted, and with a much narrower apical portion. Second abdominal sternite with or without more or less developed preapical protuberances or spines. Transverse corrugation of propodeum very regular and sharp, extending over its dorsal areas. Length (h.+th.+t. 1+2): 20-21 mm. *S. mirabilis*, Guérin.
 Black, with the 4 or 5 apical tergites of abdomen marked with orange-red. Apical margin of clypeus semicircularly emarginate, its lateral edges short, sharply dentate and widely separate. Dorsal areas of propodeum either transversely corrugated or rugosely reticulate 3.
3. Middle femora distinctly flattened and somewhat twisted; anterior face depressed or slightly hollowed towards base. Mandibles of irregular shape, with projecting median tooth in front of middle of inner margin. Clypeus glossy, about as broad as long, very deeply emarginate. Four or five apical tergites of abdomen orange-red. In the var. *bequaerti*, H. Brauns, the 2nd abdominal tergite bears also 2 large, orange-red spots. Length (h.+th.+t. 1+2): 18 mm. *S. maxillosa*, Saussure.
 Middle femora of normal shape, convex on anterior face. Clypeus rather dull, somewhat longer than broad, more shallowly emarginate. Mandibles normal, shaped almost as in the female. Second abdominal sternite with 2 transverse, more or less conspicuous, preapical welts or ridges. In the typical form with 4, in the var. *emarginata* (Saussure) with 5 apical segments of the abdomen orange-red; in the var. *albofasciata*, Maidl, with 4 apical segments white. Length (h.+th.+t. 1+2): 16-19 mm. *S. abyssinica*, Guérin.
4. Middle femora distinctly flattened; anterior face with a feebly oblique, basal depression; lower margin markedly projecting about the basal $\frac{1}{3}$. Clypeus as a rule longer than broad, its elongate, terminal portion more or less flattened or slightly depressed on sides; its apical margin straight truncate or feebly sinuate, with rounded, blunt edges. Mandibles variously shaped, often much deformed, but without prebasal tooth along inner margin. Second abdominal sternite sometimes with 2 preapical protuberances. Black; the 5 apical segments of abdomen orange-red. Length (h.+th.+t. 1+2): 16-22 mm. *S. analis*, Saussure.

Middle femora normal, with convex anterior face. Clypeus as broad as, or distinctly broader than, long; its terminal portion very short and broadly truncate; its apical margin either straight or feebly sinuate, with sharp, somewhat keeled, lateral edges, often with a narrow, depressed, terminal lamella. Second abdominal sternite sometimes with preapical protuberances. Mandibles usually much deformed, often with a prebasal tooth along the inner margin. Black; the four apical segments of abdomen orange-red. Length (h. + th. + t. 1 + 2): 18-23 mm. *S. calida*, Linné.

SYNAGRIS (PARAGRIS) ABYSSINICA, Guérin.

The typical form of this species extends over the greater part of the East and South African Savannah Region, where it is one of the most common wasps (from Eritrea and the Upper Uele to Grahamstown, Willowmore, and Kowie in the Cape Province, and Gobabis and Windhoek in ex-German South-West Africa). Dr. H. Brauns writes me that this is the only species of *Synagris* at all common near Willowmore. I have seen specimens from the following localities:—

Transvaal: Johannesburg, 1 ♂ (Ross), S.A. Mus.

Orange Free State: Smithfield, 1 ♀ (Kannemeyer), S.A. Mus.

Basutoland: Morija, 1 ♀ (H. Junod).

Natal: Umbilo, 1 ♀; Durban, 2 ♀♀ (Amer. Mus. of Nat. Hist.);

Mfongosi, 1 ♀ and 1 ♂ (W. E. Jones), S.A. Mus.

Cape Province: Modder River, Kimberley, 3 ♀♀ (T. D. Butler), S.A. Mus.

The var. *emarginata*, Saussure, has, on the whole, a more northern distribution than the type: it occurs in the Lower Congo, the Katanga, Rhodesia, and in East Africa from Nyasaland to Abyssinia and the valley of the Semliki River. I have seen the following specimens:—

Katanga: Kimilololo River, near Elisabethville, 1 ♂, July 3, 1920; Lubumbashi, 1 ♀, May 23, 1920 (Mich. Bequaert).

Rhodesia: Bulawayo, 1 ♂, October 29, 1911 (G. Arnold), Rhod. Mus.; Salisbury, 1 ♀ (Dr. M. Melle Arcturus), S.A. Mus.

The var. *albofasciata*, Maidl, is known only from north of 10° S. lat.

SYNAGRIS (PARAGRIS) ANALIS, Saussure.

This species has much the same distribution as the foregoing and is often equally common. Dr. H. Brauns has occasionally collected it near Willowmore, where, he reports, it is much rarer than *abyssinica*. All the specimens I have seen belong to the typical form:—

Katanga: Panda River, 1 ♀, October 18, 1920 (Mich. Bequaert).

Rhodesia: Victoria Falls, 1 ♀ (W. L. Sclater); Salisbury, 1 ♂

(Dr. Melle Arcturus), S.A. Mus. ; Bulawayo, 1 ♀, September 17, 1919 (G. Arnold), Rhod. Mus.

Portuguese East Africa : Lourenzo Marques, several ♂♂ and ♀♀ (H. Junod), Coll. Cornell Univ. ; Delagoa Bay, 1 ♀, S.A. Mus.

Transvaal : Barberton, 1 ♂ (H. Edwards), and Acornhoek, 1 ♀ (R. W. Tucker), S.A. Mus.

Natal : Durban, 1 ♂ (O'Neil), S.A. Mus.

Cape Province : Mossel Bay, 1 ♀ (B. Power), S.A. Mus.

There is also in the South African Museum a male of this species from Waterberg, ex-German South-West Africa (R. W. Tucker). According to Maidl, this should be referred to his var. *nigroclypeata*, the male of which, however, does not differ from that of the typical form.

SYNAGRIS (PARAGRIS) MAXILLOSA, Saussure.

This species is apparently restricted to South Africa, but is so rare that its distribution is very imperfectly known. None of the specimens seen by Maidl had exact locality labels, and, curiously enough, of the two specimens (1 ♀ and 1 ♂) in the South African Museum the locality is also unrecorded.

Dr. H. Brauns has discovered in the Cape Province an interesting colour variation, of which he has sent me the following description :—

SYNAGRIS MAXILLOSA var. BEQUAERTI, H. Brauns.

“ *Male*.—This variety has all the morphological characters of typical *maxillosa*, Saussure. It is also the same size. The 2nd abdominal tergite has on each side of the anterior third an oval, orange-coloured, well-defined spot, which does not reach any of the margins and stretches diagonally from near the middle line towards the sides. Scape and flagellum of the antennae yellowish red, with the two penultimate joints and the apex of the preceding joint black. Colouration otherwise as in the typical form. Type : male, taken 16 miles from Willowmore, on the way to Uniondale, Cape Province, October 20, 1919 (Coll. H. Brauns).”

I have seen a male of this variety from Tulbagh, Cape Province (R. M. Lightfoot), in the collection of the South African Museum.

SYNAGRIS (PARAGRIS) MIRABILIS, Guérin.

This beautiful wasp occurs in East Africa from Abyssinia to Natal, and inland as far west as Katanga and Rhodesia. I have seen specimens from the following localities :—

Katanga : Panda River, 1 ♀, September 9, 1920, and Elizabeth-

ville, 1 ♀, April 29, 1920 (Mich. Bequaert). In this district it is to be found as far north as the Lukuga River (about 6° S. lat.).

Rhodesia: Driefontein, 1 ♀, January 1, 1920 (G. Arnold),
Rhod. Mus.; Salisbury, 2 ♂♂ (Dr. Melle Arcturus), S.A. Mus.
Transvaal: Maboki, Lydenburg, 1 ♀ (F. J. Kroeger), S.A. Mus.
Natal: Durban, 1 ♀ (Marley), S.A. Mus.

SUBGENUS RHYNCHAGRIS, Maidl.

In this group is included but one species, *Synagris vicaria*, Stadelmann. The typical form is black, with ivory-white spots or incomplete bands on all or some of the 3 (female) or 4 (male) apical tergites of the abdomen; clypeus, mandibles, antennae, parts of the head and of the fore legs more or less indigo-red. In the var. *luteopicta*, Maidl, the 2 or 3 apical tergites of the abdomen are orange-red instead of white. Length (h.+th.+t. 1+2): 16.5 mm.

I have seen a female of the typical form from 10 miles north of Lusaka, Northern Rhodesia, October 1913 (G. Arnold), Rhod. Mus. In this specimen the anal segment is entirely black; the white spots cover the major part of tergites 4 and 5, but are completely separated on the middle line by a black triangle which is much broader on tergite 4.

The typical *S. vicaria* is known only from the Katanga, Tanganyika, Northern Rhodesia, and Nyasaland; the var. *luteopicta* extends as far north as Uganda.

SUBGENUS PSEUDAGRIS, Saussure.

This subgenus contains but one species in the region under consideration: *Synagris carinata*, Saussure. Female black; the posterior margin of tergite 3, the 4th to 6th tergites entirely and the corresponding sternites partly, orange-yellow; clypeus, mandibles, antennae, parts of the head and of the fore legs, indigo-red. Length (h.+th.+t. 1+2): 15 mm. The male is unknown.

Until recently this species was known only from the single type, a female (not a male as described by Saussure) from Port Natal. The South African Museum has a female from Durban, Natal, January 1915 (Marley), which was correctly identified as *carinata* by Mr. J. C. Bridwell, and agrees perfectly with Saussure's original description.

I wish to acknowledge my indebtedness to the following gentlemen, who, through the loan of specimens or otherwise, have made the writing of this paper possible: Dr. H. Brauns, of Willowmore; Dr. L. Péringuey, Director of the South African Museum, Cape Town; and Dr. G. Arnold, Curator of the Rhodesian Museum, Bulawayo. My brother, Dr. Michel Bequaert, has sent several of the species recorded from the Katanga. I am also under great obligation to Dr. Péringuey for the publication of this article in the *Annals of the South African Museum*.

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INDEX.

A		PAGE	M		PAGE
abyssinica (Paragris)		444	maxillosa (Paragris)		445
albofasciata (Paragris abyssinica var.)		444	mirabilis (Paragris)		445
analisis (Paragris)		444	N		
B			nigroclypeata (Paragris analis var.)		445
bequaerti (Paragris maxillosa var.)		445	nyassae (Synagris cornuta var.)		441
C			P		
calida (Paragris)		442	Paragris		442
carinata (Pseudagris)		446	proserpina (Synagris)		441
cornuta (Synagris)		441	Pseudagris		446
E			R		
emarginata (Paragris abyssinica var.)		444	Rhynchagris		446
F			S		
flavomaculata (Synagris)		441	Synagris		441
L			V		
luteopicta (Rhynchagris vicaria var.)		446	vicaria (Rhynchagris)		446