Notes concerning African Myrmeleonidae. I.

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With 10 Figures in the text.

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Having had before me a large lot of African Myrmeleonidae from Stockholm Riksmuseum, forwarded to me by Professor Dr. YNGVE SJÖSTEDT, to whom I am much indebted for the opportunity of going through this interesting material, the work of determination has led me to examine some genera rather closely, and therefore, I give below some notes concerning the results of this. Some of the results concerning the examination of a fine lot from South Africa, belonging to Dr. Ris, Rheinau, and collected by Mr. JUNOD, are also included here.

The systematics of the Myrmeleonidae needs a thorough revision, and I am convinced that it may be necessary to take up the «Kleinadernstudium» in conformity with the work done by Professor L. KRÜGER in his study of the Osmylidae (Stett. entom. Zeitschr. 1912 et seq.).

It is possible that my explanations and names of some of the nervures may be changed, when the necessary examinations of the nervation in the pupal stage are made, but I hope that my notes may still be of some value to future systematists.
I. Palparini.

In the *Palparini* the *Rs* in the hindwing arises so far out that there is at least two crossveins before its origin, and where the tip of *Cu₂* in the hindwing unites with *I A* by a short crossvein, this crossvein continues as a curved and recurrent nervure, running almost parallel with *Cu₁*, until it reaches the first sector from *Cu₁*, with which it unites. Several longitudinal nervures arise from the recurrent vein, their numbers are more or less different in the different species. Between *M* and *Cu₁* in the forewing is found an oblique crossvein somewhat further out than the cubital fork. This oblique crossvein is very distinct, and I name it the "oblique vein". *Cu₂* in the forewing is curved, and it runs directly into the hind margin. From *Cu₂* several longitudinal nervures are running towards the posterior margin. Between the first of these nervures and the first of the sectors from *Cu₁* runs a longitudinal, intercalary vein, which very often has the likeness of a branch of the sector from *Cu₁* or of a sector proper, but as a rule it furcates further out and nearer the margin than the sectors. The Palparid-genus *Valignanus Navas* (Memorias Real Acad. Cienc. Artes, Barcelona, pag. 494, 1913) which was founded for the Indian species *scotti* Navas (loc. cit.) especially on the presence of a curved and recurrent vein from the *Cu₂* in the forewing, is probably only a synonym of *Symathetes* Mac Lachlan (Journ. Linn. Soc. IX, p. 237, 1867), but at present I cannot decide it, because I lack sufficient material. The character is a good generic one, and it is found in *Symathetes contrarius* Walker from India, in *Crambomorphus grandidieri* Weele from Madagascar, in *Palpares* sp. Weele (Bull. Scient. France et Belgique, p. 263, Pl. IX, fig. 8, 1907) from Madagascar and in other species.

The most valuable attempt to clear up the great confusion in the synonymy concerning the African species of the *Palparini* is made by N. Banks in »Ann. Ent. Soc. Amer., Vol. VI, p. 171–190, 1913«, and when he says, »I am quite certain that a still greater number should also be placed as

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*This crossvein is found in the forewing only, and as far as I know in all the Myrmeleonidae. I think its place in relation to the cubital fork and to other main-nervures may be of some systematical value."
synonyms, or at most varieties, I subscribe his opinion in every way, and I suppose that when so many new species from Africa have been described during the last few years, the reason is that too much stress has been laid on the shape and number of markings on the wings as specific characters. I believe that these markings in many cases are only of secondary value, and that there may be great variations within the various species as to them.


**Palpares nyicanus** KOLBE, Die Netzflügler Deutsch-Ost-Africas, p. 11, Taf. IV, fig. 6, 1897.

**Palpares ñemulus** PÉRINGUEY, Ann. South-African Mus., p. 31, fig. 1, 1911.

**Palpares sobrinus** PÉRINGUEY, ibid., p. 33, fig. 3, 1911.


This species was described by MAC LACHLAN from a male from Zambesi River and a female from Damara Land. Present in the collection was a typical specimen, ♂, from Brit. East Africa (LÖNNBERG leg.), three specimens from Caffraria (WAHLBERG leg.) and one from Damara Land (DE VYLDER leg.). The four last mentioned specimens agreed in every respect with *P. ñemulus*, of which form I have a specimen in my own collection presented to me by the author himself. It is quite certain that *P. ñemulus* and *P. nyicanus* are *P. sparsus*, and as to *P. sobrinus* and *P. nudatus* I have no doubt that these two species may be referred to the same. In the material before me (including several specimens in my own collection) are connecting-forms from the small-dotted *sparsus—sobrinus* to *nyicanus—ñemulus* with the large dots on the hindwing.

In *P. sparsus* the Rs arises opposite to the cubital fork, and in the forewing the Rs forks 3—5 cells from its base, in the hindwing 2—4 cells. The »oblique vein« is placed nearer to the cubital fork than to the origin of the first sector from *Cu*₁. The intercalary nervure arises from *Cu*₁ like a sector a little beyond the »oblique vein«.

The species has a wide range in Africa, and along the East coast it goes as far north as German East Africa.

Of this interesting species one male from Eritrea (Iwarson leg.) was present. It is closely allied to the foregoing species, but very distinct. The arrangement and the shape of the dots is the same, but the dots are yellowish brown. The thorax is provided with very long, pale yellowish hair; the abdomen is pale reddish brown. Rs arises a little more distally than the fork of cubitus, and in both pairs of wings it forks in the first cellule from its base. The »oblique vein« is placed nearer to the origin of the first sector from $Cu_1$ than to the cubital fork.


Fig. 1.


Of this rare species a male and a female were present from Damara Land (De Vylder leg.). It is a distinct species belonging to the radiatus-group, and it may be a mistake, when N. Banks (loc. cit.) places the species as synonym to P. immensus Mac Lachl. In the forewing Rs arises further out than the cubital fork, in the hindwing opposite to or a little further out. In both pairs of wings the radial sector forks 3—4 cellules from its base. In the forewing the $Cu_2$ and $IA$ are only curved a little, and the angle between $Cu_1$ and $Cu_2$ is very acute, much more so than in other species of the group. The »oblique vein« is placed in the middle between the cubital fork and the origin of the first sector from $Cu_1$. The antennae are black; the two basal joints partly yellowish and strongly blackish haired. The appendages of the male are relatively shorter and more curved than in radiatus.

Rambur described the species upon a male specimen from Senegal, still present in the Sélys’ian collection in Bruxelles, where I have seen it. It is a very rare species, not present in the collection from Stockholm Museum; but I have a pair, ♂♀, from Senegal in my own collection, and as far as I know, no descriptions or notes exist concerning the female. In this sex the markings on the wings, especially on the hindwings are much more prominent than in the male sex. The two first joints of the antennae and the basal part of the third reddish yellow with short white bristles. Rs arises in the forewing a little beyond the cubital fork, in the hindwing a little before, and in both pairs of wings it forks 3—4 cells from its origin. The angle between Cu₁ and Cu₂ in the forewing is not so acute as in kalahariensis. The oblique vein is placed nearer to the cubital fork than to the origin of the first cubital sector. A closely related species is P. incommodus Walker (Neur. Ins. Brit. Mus., p. 309, 1853), described from a specimen (abdomen mutilated) from West Africa. I have not seen the type-specimen, but N. Banks has seen it (Brit. Mus.), and he states that P. rubescens Stitz (Mitt. Zool. Mus. Berlin, p. 111, fig. 7, 1912), P. costatus Navas (Ann. Soc. Brux., p. 13, fig. 6, 1912) and P. rieli Navas (Insecta, Rennes, p. 69, fig. 1, 1912) are the same species, and he is undoubtedly right. But if so, it seems to me that there is a great probability, that incommodus in that
case is only a more strongly marked form of *P. radiatus*. The figure of *rubescens* shows conformity as to the nervation with *radiatus*.


*P. bayeri* Navas, Revue Zool. Afric., p. 370, pl. X, fig. 4, 1913 (Congo, Beni).


I believe that this species has been misunderstood by several authors. In the Stockholm Museum is present a typical specimen (♀) from Congo (Ekbloom leg.), which agrees in every point with the excellent description, given by Gerstaecker. The species is nearly related to *P. tigris*, but very distinct. It has a blackish crossband above the antennæ and a longitudinal median band on the vertex, connected in front with the crossband. Legs dark reddish brown, bristles, tarsi, and tip of tibiae black. In the forewing *Rs* arises opposite to or a little beyond the cubital fork, in the hindwing a little before. *Rs* forks 2—3 cellules from its base in both pairs of the wings. The »oblique vein« is placed in the middle between the cubital fork and the first cubital sector.


P. dilatatus Navas, ibid., p. 36, fig. 2, 1912 (Congo, Brazzaville).


Present 1 ♂ and 1 ♀ from Congo (DANNFELT leg.). The species is closely allied to the foregoing, but it is of a smaller size, and the wings have a more strongly yellowish tinge. In both pairs of the wings Rs arises opposite to or a little before the cubital fork, and the sector forks 2—3 cellules from its base. The »oblique vein« is nearer to the cubital fork than to the first cubital sector. The intercalary vein arises from Cu, a little beyond the »oblique vein« like a sector.

Fig. 4. 

The anal appendages of the male are of the same size and shape as in radiatus. I am quite certain that ictericus and dilatatus are the same species as aegrotus, but with regard to ornatus (type-specimen in Vienna Museum) I have some doubt, especially because the drawing of the wings shows that Rs arises before the cubital fork.


Of this species I have seen three specimens. One male and one female in the collection from Stockholm Museum and one female in my own collection; all these specimens are from British East Africa. The type-specimen, ♀ (Museum Vienna) is from Kilimandjaro. In »Ann. Ent. Soc. Amer.,
p. 184, 1913» Banks has placed this species as synonymous with *P. digitatus* Gerst., but I cannot believe this is correct. *P. torridus* is a much larger species with four distinct crossbands on the forewing and with a larger spot on the fork of the cubitus in the hindwing. The bands on the forewings are darkly reticulated, and the centre of the cellules paler. In the forewing *Rs* arises somewhat further out than the cubital fork, and the sector forks into the third cellule, reckoned from its base. In the hindwing *Rs* arises opposite to or a little before the cubital fork, and the sector furcates into the second or third cellule. The »oblique vein», is nearer to the origin of the first sector from *Cu₁* than to the cubital fork.

![Fig. 5. Palpares torridus. Mus. Stockholm.](image)

With regard to *P. digitatus* Gerstäcker (Mitt. naturw. Verein f. Neu-Vorpomm. und Rügen, p. 117, 1893), of which species I have a specimen from Guinea in my own collection, this species may be easily separated from *P. torridus* by its smaller size, by the uniformly coloured crossbands on the forewing and by the much smaller spot on the fork of the cubitus in the hindwing (sometimes this spot is almost absent). In both pairs of the wings *Rs* arises before the cubital fork, and the sector furcates 2 or 3 cellules from its base. The »oblique vein» is about in the middle between the cubital fork and the origin of the first cubital sector. This sector arises opposite to the spot, where *Cu₂* joins the hind margin, or a little before. In *P. torridus* *Cu₂* runs into the hind margin somewhat before the origin of the cubital sector. *P. pobe-

**Palpares immensus** Mac Lachlan. — Journ. Linn. Soc. Lond., p. 239, 1867 (Damara Land).

Present one female from Swakopmund (WAHLBERG leg.) in Stockholm Museum and one female in my collection from Cape Colony (PÉRINGUEY ded.). In the forewing Rs arises opposite to the cubital fork, and it furcates 4 cellules from its base; in the hindwing Rs arises somewhat before the cubital fork, and it furcates into the third or fourth cellule from its base. The »oblique vein» is placed in the middle between the cubital fork and the origin of the first cubital sector.


Present in Stockholm Museum one male and one female from Congo (EKBLOM leg.) and in my own collection one female from Angola and one from Rikatla, Lor. Marq. (JUNOD leg.). In the forewing the Rs arises further out than the cubital fork, and it forks into the second cellule from its base. In the hindwing Rs arises a little before the cubital fork, and it furcates into the second or third cellule from its base. The »oblique vein» is a little nearer to the cubital fork than to the origin of the first cubital sector.
Nosa leonina Navas, Revue Zool. Afric., p. 239, fig. 5, 1911.
Nosa calceata Navas, ibid., p. 10, fig. 3, 1912.

In the collection of the Stockholm Museum one specimen (wanting the abdomen) was present. It seems to be an old specimen, and it is labelled «Cape» and «Palpares manicatus Rbr., tigris Dalm.» In my own collection several specimens from Erythrea (Gunnar Kristensen leg.) and from Congo Belge (Jensen-Tusch leg.). In the forewing Rs arises further out than the cubital fork, and it furcates generally into the cellule at its base. In the hindwing Rs arises a little beyond the cubital fork, and it furcates into the first or the second cellule from its origin. The «oblique vein» is placed in the middle between the cubital fork and the origin of the first cubital sector. In this species the second branch from Rs arises often in such a manner that there seems to be two radial sectors. On such a specimen with divergent nervation Navas has founded his genus Nosa (Revue Zool. Afric., p. 239, 1911). In the very same specimen of this species one or two wings have normal nervation, and the other wings divergent nervation.

Present one male from Caffraria (WAHLBERG leg.). This species has been misunderstood by several Entomologist, probably due to its tendency to vary. In the present specimen the yellowish crossband before apex of the forewing is divided into two parts, and the dark crossbands on the hindwing are connected, which rarely takes place. In this respect the present specimen shows much affinity to **P. festivus**. The *Rs* in forewing arises opposite to the fork of cubitus, and the sector forks 2 cellules from its base. In the hindwing the *Rs* arises a little before the cubital fork. The »oblique vein» is nearer to the origin of the first sector from *Cu*, than to the cubital fork.

In **P. festivus** GERSTAECKER (Mitt. naturw. Verein f. Neu-Vorpomm. und Rügen, p. 115, 1893), of which species I have a male specimen from Delagoa in my collection, the *Rs* arises before the cubital fork; in the hindwing nearer to the base than in the forewing. **P. mosambicus** PERINGUEY (Ann. South African Mus., p. 434, 1910) and **P. latro** NAVAS (Revue Zool. Afr., p. 238, pl. 14, fig. 3, 1911) are synonyms of **P. festivus**. In »Ann. Soc. scient. Brux., p. 27, 1912» NAVAS has founded a genus, **Palparellus**, for **flavofasciatus, spectrum, festivus** etc. This genus is a synonym of **Palpares**.

**Valignanus compositus** NAVAS. — (**Palpares compositus**) NAVAS, Ann. Soc. scient. Brux., p. 12, fig. 15, 1912.

Of this species was present a male specimen from Kuisip. BANKS (Ann. Ent. Soc. Amer., p. 185, 1913) places **P. mistus** NAVAS (Ann. Soc. scient. Brux., p. 28, fig. 14, 1912) as a synonym of **V. compositus**. I know **P. mistus** only from the description and from the drawing of the hindwing, and therefore I can not say anything about the species. In the forewing of **compositus** we have the same recurrent nervure from *Cu*₂ as in the hindwing, and therefore I for the present place the species in the Indian genus **Valignanus NAVAS** (Mem. Real Acad. Cienc. Art. Barcel., p. 494, 1913). Whether the species in the future still may be placed in that genus or probably in a new one, I can not decide, before I have seen a specimen of **V. scotti** NAVAS.
II. Acanthaclisini.

In *Acanthaclisis* *Rambur* (sens. str.) the *Cu*₂ in the forewing is bent or curved in its apical part towards the base of the wing. The intercubital area (the area between *Cu*₁ and *Cu*₂) is very acute towards the base of the wing. The »oblique vein« joins the *Cu*₁ about in the middle between the fork and the first branch from *Cu*₂. The intercubital plicate line (partly formed by the bent sectors from *Cu*₁) is very distinct and arises from the first branch from *Cu*₂. *M* forms nearly a straight line in both pairs of the wings; it is only bent a little near its apex. The first branch from *Rs* forks two or three times near its apex. The radial plicate line (partly formed by the bent branches from *Rs*) is very distinct, and it arises from the first branch from *Rs*. The costal area rather broad and with two rows of cellules. In the hindwing *1A* and *Cu*₂ coalesce for a longer distance. Both the radial and the intercubital plicate line are distinct. Prothorax broader than long.

During the last years the genus *Acanthaclisis* (sens. lat.) is split up in several genera, and the above named characters agree only with the genus (sens. str.) with *A. occitanica* *Vill.* as geno-type.

If the shape of the spurs may be considered as being of generic value, it will be necessary to place the Australian species *fundata* *Walk.* in a new genus, as this species has not angulate spurs. The African species *dasymalla* *Gerst.* has also slightly curved spurs, and in the forewing the costal area is rather narrow and has only two rows of cellules a little before the pterostigma.

*A. occitanica* *Vill.* — Linn. Ent., p. 63, pl. VIII, fig. 10, 1789.

Two females were present; one labelled »Mus. Payk.«; the other »Schönherr« and »M. Georgiana Fisch. Tauria-Steven«.


Present one female from Rhodus (Hedenb. leg.). In »Ent. Monthl. Mag., Vol. XX, p. 181—84« Mac Lachlan has pointed
out a string of characters, by which the two European species may be separated. I supplement those by the following: In the forewing the radial plicate line arises from first branch from Rs; the connecting-vein between first and second branch is very long in occitanica, rather short in baetica. In the hindwing Cu, and Cu₂ form nearly a right angle in occitanica, but a rather acute one in baetica. In baetica Cu₂ in the hindwing runs to the margin in a straight direction, in occitanica Cu₂ is rather sinuate.


Present one specimen from Melbourne. Spurs bent, not angulate. The connecting-vein between first and second branch from Rs is very short in the forewing.


Sogra Navas, Broteria, p. 43, 1912.

In this genus the Cu₂ in the forewing is running in straight direction towards the hind margin. In the hindwing Cu₂ and 1 A coalesce as in Acanthoclisis. M is rather curved in its apical part, and first branch from Rs forks nearer to the base of the wing than in Acanthaclisis and has at least four branches. The plicate lines distinct with the exception of the line in the intercubital area in the hindwing, which is indistinct in its basal part. Costal area in forewing narrow, cross veins mostly simple, only forked or sometimes also anastomosed a little before pterostigma. Prothorax broader than long.

This genus includes several African species, and I am sure that a number of genera, founded on African species during the last years are only synonyms of it.


Prothorax with a broad dark median streak, widened towards the hind margin where it encloses a pale oblong spot at each side; the dark median streak as a rule divided by a pale narrow longitudinal line. At each side of the median streak a dark sinuate and sometimes abrupt streak; side margins dark. Meso- and metathorax with dark streaks.
In the forewing — sometimes also indicated in the hindwing — $M$ and $Cu_1$ have each four corresponding dark streaks connected with dark cross veins. The "oblique vein" nearer to the cubital fork than to the origin of the first sector from $Cu_1$. The radial plicate line in the forewing arises from first branch from $Rs$ before the origin of second branch, and the connecting-vein between these two branches rather short.

I am sure that several of the Navas'ian species from Africa, f. inst. *difficilis, perversa, mordax* and *iracunda*, are only sononyms of *C. distincta*. I have seen a specimen of *Sogra iracunda*, determined and named by Navas himself, in Vienna Mus.; this specimen was a true *distincta*.

*Mus. Stockholm:* 2 ♂, Tamatave, Madagascar (Kaudern leg.); 1 ♂, 1 ♀, Damara (De Vylde leg.); 1 ♂, Namaqua (De Vylde leg.); 1 ♀, Brit. E. Afr. (Lindblom leg.); 1 ♀, Africa (Schönherr).

*Coll. Ris:* 2 ♂, 2 ♀, from Rikatla, Lor. Marq. (Junod leg.).

*Mus. Copenhagen:* 1 ♀, Caffraria; 1 ♀, Guinea.

*Coll. Esben-Petersen:* 1 ♀, Abessinia (G. Kristensen leg.); 1 ♂, 1 ♀, German South West. Afr.

As it will be seen of the above named localities the species has a wide range in Africa.

**Centroclisis distincta var. lineatipennis Péringuey.** — Ann. South Afr. Mus., p. 443, pl. VIII, fig. 8, 1910.

I consider the species of Péringuey only as a variety of Rambur's species. The colour of the body, the nervation of the wings and the appendages of the male are quite the same; the only difference is the strongly shaded $M$, $Cu$, and cross veins, lying between these two longitudinal nervures, in the forewing.

*Mus. Stockholm:* 1 ♂, Kigonsera, East Africa; 1 ♀, Mukimbungu, Congo (Laman leg.).

*Coll. Esben-Petersen:* 1 ♀, Abessinia (G. Kristensen leg.).

In the female from Abessinia and in the male from Kigonsera only the $M$ is shaded, and they form a fine connecting-link between *distincta* and the typical *lineatipennis*. In the female from Mukimbungu the shade is very strong, and also the intercubital plicate line in the forewing is shaded where it arises from $Cu_2$. 

One female specimen from Rikatla, Lor. Marq. (Junod leg.) in my collection.


A fine male specimen from Tomatave, Madagascar (Kaudern leg.) is present in Stockholm Mus. The Indian genus Onclus Navas is closely allied to the genus Syngenes Kolbe.

III. Myrmeleonini.


Coll. Ris: 1 ♂, 2 ♀, Rikatla, Lor. Marq. (Junod leg.).

Here Navas has made the same mistake as in describing the genus Nosa. Amongst the specimens of doralice examples sometimes occur with apparently two radial sectors in the forewings, and upon such an aberring specimen Navas has founded his genus what even Banks (loc. cit.) has pointed out. In the material before me the two specimens have normal nervation; the third has aberrant nervation in both forewings; the fourth specimen has aberrant nervation in the right forewing and normal nervation in the left forewing.

IV. Creagrini.


Gama inclitus Navas, Broteria, p. 57, 1912.

Mus. Stockholm: 1 specimen, Caffraria (Wahlberg leg.).

Navas (loc. cit.) has founded a new genus for this species. It seems to me that the generic characters, named by him, are so small and insufficient that it is unsatisfactory
to retain the genus. The nervation of the wings is quite the same as in the genus *Creagris*.

*Creagris junodi* nov. spec. — Palpi yellowish. Mandibles brown at their apex. Face yellowish. A shining brownish black, transverse band below the insertion of the antennae; the band is connected with a blackish longitudinal streak between the antennae. Front and vertex blackish brown with orange-coloured spots. Antennae dark brown; the antennal groove and the apex of the two basal joints orange. The club yellowish on its underside. Prothorax nearly as long as broad, orange, with a sooty brown median streak, enclosing a narrow and indistinct paler one; the lateral margins with a narrow black streak. Meso- and metathorax sooty black with orange spots. Sides and underside of thorax sooty black with orange spots. Coxae orange; femora, tibiae and tarsi yellowish brown, base of femora orange. Spurs and claws yellowish brown. Abdomen shining blackish. Wings hyaline, unspotted. Nervature greenish yellow; subcosta and radius orange; in the forewing the former has indications of brown streaks in its basal third. Wing roots orange. Pterostigma with an orange-brown streak. A straight dark streak is indicated in the tip of the hindwing.

Length of fore- and hindwing 35 mm.

Two specimens from Botchabélo, South Africa, alt. 1200 m (Junod leg.). The type specimen in my collection.
V. Dendroleini.


Mironus NAVAS, Memorias Real Acad., Barcelona, p. 497, 1913.

This genus is only known from Africa (Madagascar incl.). Instead of giving a real description of the genus GERSTAECKER compared his new genus with Glenurus HAGEN, Episalus GERST. and Periclystus GERST., and the generic characters are therefore to be found in his description of the species mirabilis from Cameroon. When GERSTAECKER only pointed out the main-characters it was because the genus was so easily recognizable, what GERSTAECKER also remarks. I have looked upon several specimens of mirabilis, and it seems to me that there are two forms. In the one the basal tarsal joint is not longer than the apical joint, the tip of the hindwing is more elongate and much more pointed, and the antennae longer; in the other form the basal tarsal joint is longer than the apical one, and the tip of hindwing not so pointed. There are also small differences in the shape and size of the elevations on the vertex. I suppose these are sexual differences only, but unfortunately my material is in such condition, that the determination of the sex is impossible. I think that NAVAS when he described the genus Mironus did not know the genus Cymothales, because in that case no reason was present for introducing a new genus.

Cymothales spectabilis nov. spec. — Head, thorax and abdomen (the apex lost) yellowish red.¹ Frons between the antennae somewhat darker. Antennae, hardly as long as head and thorax united, yellowish red, the two basal joints and the base of the third brown; the club scarcely indicated. Prothorax about one and a half times as long as broad, a little narrowed in front; a narrow blackish longitudinal median line, which does not reach either the front or the hind margin; a short narrow yellowish white streak at the base

¹ The interior of the specimen is destroyed by insects, and therefore the colours are possibly somewhat paler than when the insect was alive.
at each side. Meso- and metathorax at each side with a yellowish white streak. Legs pale reddish yellow; front femora somewhat darker. Tip of tibiae and tarsal joints pale reddish brown. Tibiae with an abrupt blackish brown band near their base. Bristles pale, spurs and claws reddish brown. Spurs as long as first and second joint united. First tarsal joint almost as long as fifth, which is as long as second, third and fourth united. Membrane of wings hyaline iridescent. Nervures pale yellowish. Markings reddish yellow or pale yellowish brown with reddish tinge. The cross veins in the spot at the origin of Rs yellowish margined.

Length of forewing 30 mm; that of hindwing 32 mm.

One specimen from British East Africa (Lindblom leg.) in Mus. Stockholm.

Fig. 8.
*Cymothales spectabiles.* Mus. Stockholm.

VI. Formicaleonini.

**Gandulus Navas.** — Broteria, p. 73, 1912.

This genus was founded by Navas for a new species *G. leptogaster* (Broteria, p. 73, 1912) from Brit. South. Africa, a species which is the same as *Myrmeleon filiformis* Gerst. The genus is a good one, and below I give some supplementary notes to the description of Navas.

Antennae with distinct club and at least as long as the thorax. Abdomen in the male long and slender, longer than the wings. The appendages formed as in *Macronemurus* but shorter. Legs rather slender; spurs straight and long, at least as long as first tarsal joint, which is much longer than any of the following three and almost as long as the fifth.
Wings long and narrow with rather acute apex. In the forewing the $Cu_2$ is almost running parallel to $Cu_1$ and the posterior margin as in the genus *Creagris*, but it is much shorter, and it ends before the origin of the first branch from $Rs$. In both pairs of wings 1$A$ forms a straight line, and the space between 1$A$ and the posterior border is gradually narrowing towards the end of 1$A$. The radial plicate line wanting or slightly indicated, the intercubital plicate line very distinct and running close to and parallel with $Cu_1$. Several cross veins before $Rs$ in the forewing, one in the hindwing. In the hindwing $Cu_1$ runs parallel with and close to the posterior margin, and only two rows of cellules are found between the $Cu_1$ and the margin the two thirds of the way.

As to the long first tarsal joint this genus has some likeness to *Pseudoformicaleo* Weele, but there are some differences in the nervation of the wings, especially in the shape of 1$A$. From the genus *Creagris* it is separated by the shorter cubital fork in the forewing, but especially by the different shape of 1$A$. In *Creagris* the 1$A$ in the forewing is running rather far away from the hind margin.


**Gandulus leptogaster** Navas, Broteria, p. 73, 1912.

An old and somewhat damaged female specimen, labelled "S. Leona, Afzelius" is present in the Stockholm Mus. In my own collection I have a male specimen from Fort Crampel, French Congo, and I have seen a number of specimens from French Congo in other collections.


**Neuroleon angustus** Navas, Revue Zool. Afr., p. 41, 1912 (Africa centr.).

In Stockholm Mus. is present one specimen (abdomen lost) from Congo (Dannfeldt leg.). In my own collection is placed the type-specimen (♀) of *Nemoleon alcidice*. I have
seen a number of specimens of the species in other collections, especially from Congo. The male in the two above named species has rather long appendages.


Mus. Stockholm: One specimen (abdomen lost) from Congo. Coll. Esben-Petersen: 1 ♀, from Congo Belge (Jensen-Tusch leg.).

I have seen several specimens of this species from Congo Belge in other collections. In the male the abdomen is only a little longer than the wings.

Gandulus risi nov. spec. — Face reddish brown. Labial and maxillary palpi yellowish; the apical joint blackish brown. Head below and above the antennae dark brown. Vertex reddish brown with two transverse rows of blackish spots; four spots in the front row and sex in the hind one. Between the two rows two small spots. Antennae brown, longer than head and thorax united and with distinct club. Prothorax a little broader than long, narrowed in front, greyish brown, with a paler indistinct narrow median stripe and a pale indistinct, sinuate stripe at each side. A transverse furrow one third from the front margin; on the furrow a black dot at each side. Meso- and metathorax dark brown to greyish black and with narrow, pale margins. Abdomen blackish, very long and slender and whitish haired. The appendages of the male shining blackish and with long, black and erected bristles. Legs strong, rather short, yellowish brown, with long white and blackish bristles. Femur longer than tibia, which is shorter than the tarsus. Front and hind femora dark on their upper side, especially towards apex. Tibiae with a narrow band near base and a broader one at apex. All the tarsal joints blackish at apex. First tarsal joint as
long as the three following joints united, a little shorter than the fifth. Spurs straight and as long as first, second and third tarsal joint united. Wings long and narrow. The longitudinal nervures blackish and whitish. Cross veins either totally whitish (in some parts of the wings), or totally blackish, or partly whitish and blackish. Pterostigma yellowish red, in the forewing with a large blackish spot at the base. In the forewing the series of gradate veins and the oblique veins at the end of 1 A are faintly shaded; the radial plicate line slightly indicated, the intercubital one more distinct. Length of abdomen 34 mm; that of forewing 27 mm and that of hindwing 24.5 mm.

One male, Shilomane, Transvaal, 8. IX. 1899 (Junod leg.), in my collection.

I dedicate this species to my friend and colleague Dr Ris, Rheinau.

**Formicaleo majungalensis** nov. spec. — Head clear yellowish. Maxillar and labial palpi whitish yellow; the apical joint of the latter with a blackish brown band before the acute tip. Below the antennae a shining blackish cross streak, which does not reach the margins of the eyes. Above the antennae, which are lost, a dull blackish crossband, and above this band a row of six blackish spots, placed three and three. The hind part of the head with several irregular blackish brown spots. Prothorax as broad as long, pale chocolate-brown with a paler indistinct longitudinal median band and with another irregular pale band at each side. The side margins of prothorax with long white bristles. Meso- and metathorax darker than the prothorax. Abdomen whitish yellow, with a narrow, abruptly and irregular brownish streak.
along the side margins and with a broad lanceolate brownish spot at the hind margin of each segment; the spot coalesces in its hind part with the lateral streaks. Fore legs (the other legs lost) whitish; femur dark on its outer side; tibia with three dark spots on the outer side, one in the middle and one at each end; third, fourth and fifth tarsal joints with dark tip. Spurs and claws yellowish. Spurs as long as the three first tarsal joints. First tarsal joint as long as second, third and fourth united; fifth joint nearly as long as all the foregoing joints united. Wings long, narrow and with rather acute tip. Membrane hyaline. Longitudinal nervures pale, with blackish brown streaks where the cross veins are touching them. Cross veins in the costal area blackish brown at each end. Some of the other cross veins totally blackish brown, others whitish. In the forewing several dark brown spots. Pterostigma with a brown spot at its base. Between radius and its sector four brown spots. Between media and cubitus three brown spots. An oblique streak from the apex of $1A$. The inner row of the series of gradate cross veins strongly brownish shaded. The radial plicate line wanting; the intercubital one present. Between the latter and $Cu_1$ one row of cellules.

Length of forewing 17 mm; that of hindwing 15.5 mm. One specimen from Majunga, Madagascar (Kaudern leg.). Type-specimen in Stockholm Museum.

Tryckt den 8 augusti 1916.
Bibliography of the Neuropterida

Reference Citation:

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