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NOTES ON AFRICAN MYRMELEONIDÆ.

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The following, mostly synonymical, notes are based chiefly on a study of types in several European museums; I have gone over these notes with the descriptions and my own material since my return. There are other species upon which I failed to make sufficient references or through lack of material in my collection am unable to verify my suspicions of their synonymy. In a few cases a species described by an old author has not been rediscovered, but it may be in some cases that the locality label is a wrong one.

Acanthaclisis.

Navas has divided this up into a number of genera, several of them on variable conditions of venation. The number of costals crossed or forked varies so much that I fail to see how one can tell where *Sogra* ends and *Acanthaclisis* begins. *Paranthaclisis* Banks (including *Centroclisis* Navas) may be a subgenus as I have already placed it, hardly more.

I have seen the types of many of Navas' new species, but cannot without more study of specimens decide on the validity of all of them.

***Sogra superba* Navas.**

The type agrees with figure and description of *Acanth. felina* Gerst.

***Sogra distincta* Rbr.**

S. difficilis Navas, *S. nigrata* Navas, and *S. perversa* Navas are this species; probably others also belong here. The type expands about 108 mm., and has four dark streaks between the median and cubital veins.

***Sogra brachygaster* Rbr.**

Myrmeleon gabonicus Fairm., and *Acanth. rufescens* Gerst., appear to be the same; *Sogra infernalis* Navas is evidently also a synonym.

***Sogra maillardi* Selys.**

Sogra pertinax Navas and *S. rixosa* Navas, according to types, are this species.

Sogra mordax Navas.

S. iracunda Navas does not differ, except in marks that are variable.

Acanthaclisis longicornis Rbr.

The type has two series of costals except on the basal sixth of wing; ten cross-veins before radial sector in fore wing, eleven branches to radial sector, numerous marks between the radius and subcosta.

Phanoclisus new genus.

Pronotum slender; costals crossed on base, not beyond, otherwise like *Acanthaclisis*.

Type, *Acanthaclisis longicollis* Rbr.

Navas has given the name *Nora* for this species, but that name is long since preoccupied.

The type has about eight cross-veins before the radial sector in each wing, ten branches to radial sector.

Myrmeleodes medius Navas.

This is *Myrmeleon doralice* Bks. In my description I mentioned the appearance of two radial sectors upon which character Navas has made his new genus. But there is really but one radial sector (as in all *Myrmeleonidæ*); the fork of the radial sector has the cross-veins so as to give it the appearance of a branch from the radius instead of a branch of the radial sector. There are no more longitudinal veins than usual in the family. The same structure appears in one species of *Palpares*.

Myrmeleon stigmalis Navas.

This is the widespread *M. obscurus* Rbr.

Myrmeleon buyssoni van der Weele.

This is a true *Myrmeleon*, and in my table of African species runs to 5, but the pronotum is yellowish, with two dark, submedian stripes.

Myrmeleon hyalinus Oliv.

Is a true *Myrmeleon*. The head is gone; the pronotum in poor condition; the metanotum has three pale spots; abdomen black, the segments faintly margined behind with yellowish; hind femora brownish, hind tibiæ dark at tip, spurs scarcely as long as first tarsal

joint; wings acute, and almost falcate at tips; many cross-veins before radial sector in each wing, nine or ten branches of the radial sector; venation entirely pale.

Myrmeleon cinereus Klug.

This is a true *Myrmeleon*; the head has a dark interantennal mark, a spot above it on middle of front, and three spots across vertex; pronotum as figured.

Myrmeleon obscurus Rbr.

Is a true *Myrmeleon*, as identified by Van der Weele; it has seven to eight cross-veins before the radial sector in fore wings, five cross-veins in hind wings, eight branches of radial sector; subcosta, radius, and cubitus strongly marked with dark. *M. capensis* Rbr. appears to be the same species, but rather larger, the venation and markings are the same.

M. fictus Walk. is the same species; *M. secretus* Walk. is probably the same, but the type is broken.

Nesoleon fasciatus Navas.

Is a true *Myrmeleon* and close to *M. obscurus*, perhaps the same.

Myrmeleon ochroneurus Rbr.

Is a true *Myrmeleon*. There is a large mark on front of the head reaching below the antennæ; vertex and pronotum as figured; thorax with some submedian pale spots; legs pale. Wings rather slender and acute, subcosta and cubitus and its branches dotted or spotted with dark, otherwise venation is pale; 14 cross-veins before radial sector in the fore wings, 8 in the hind wings, 10 branches to radial sector, a line through cubital area in both wings; in fore wings the radial sector arises plainly beyond the end of anal vein. Related to *M. lethifer* and *M. medialis*.

Formicaleo madagascariensis Weele.

Is a true *Myrmeleon*, related to *M. furcatus*.

Hagenomyia luctuosa Navas.

This is *Myrmeleon lethifer* Walk., the *M. nigradorsis* Kolbe. In the Brit. Mus. Navas has identified an entirely different insect as *M. lethifer*.

Myrmeleon pulverulentus Rbr.

This is a *Macronemurus*, spurs equal nearly three joints. A slender-bodied species with clouds at ends of all cross-veins; pronotum not very pale and marks not in strong contrast, but distinct; antennæ hardly diameter apart, a large mark above and below the antennæ dark; vertex dark leaving a pale band across the front, two submedian, rather elongate spots behind on vertex. Wings moderately narrow, costals simple, 9 cross-veins in fore wings before radial sector, 7 branches of radial sector, in fore wings four cross-veins between anal and cubital fork, in hind wing but one such vein. In fore wing the radial sector arises a little beyond cubital fork, in hind wing plainly before. Femora pale, tibia marked within, tips of tarsal joints pale, last joint more than twice as long as first, which latter is no longer than second and third.

Myrmeleon infidus Walk.

Is a *Macronemurus* and runs to *M. striola*, but the cross-veins and other veins are all pale except the subcosta is marked with dark; pronotum as figured; spurs equal two joints; five cross-veins before the radial sector in fore wing; besides the apical streak in the hind wings, there are a dozen little dark dots at forks of veins near tip of fore wing.

Nelees modestus Navas.

Runs to typical section of *Macronemurus* and is my *M. cloranthe*, differing only in some tarsal joints not as heavily marked as the type.

Nelees clathratus Navas.

Is *Macronemurus ianthe* Bks.

Formicaleo inæqualis Navas.

This is *Macronemurus euanthe* Bks.

Formicaleo atomarius Navas det.

Is *Macronemurus tinctus* Kolbe.

Formicaleo lituratus Navas.

Is *F. diversus* Navas. It is common in Abyssinia.

Formicaleo lynx Navas.

Runs to *F. hesione* Bks.

Myrmeleon subpunctatus Rbr.

A *Formicaleon*; spurs as long as three joints of tarsus; legs stout, fifth joint of tarsus twice as long as the first. Fore wings broad at stigma, which is reddish, a faint dark dot at end of anal, and at union of the median and cubital veins in fore-wings; in the hind wings an oblique dark streak toward tip, 11 branches of radial sector; antennæ close together, a large dark spot above them, thorax discolored. Runs to *F. harpalyce*, but no marks under antennæ, and the spots in fore wing, as well as smaller size, distinguish it.

Neuroleon extraneus Navas.

This is *Formicaleon lepidus* Kolbe.

Gymnoleon exilis Bks.

Gym. gaillandi Navas (Paris Mus.), *Klapalekus nubilatus* Navas (Brit. Mus.), and *Neuroleon drosimus* Navas (Brit. Mus.) all equal *G. exilis*. The *N. drosimus* has no spurs.

Gymnoleon elizabethæ Bks.

Obus arenosus Navas is this species, there are no spurs.

Creagris parallelus Klap.

This is the common *C. mortifer* Walk.; the name *parallelus* was already used by me for an Indian species.

Creagris cineraceus Navas.

Is related to *C. mortifer*, but marks of pronotum are different as in figure.

Myrmeleon mortifer Walk.

Is the *Creagris* as usually identified. *M. pervirgil* Walk. is the same species. *Creagris infirmus* Navas is the same, but the anal is not as prominently marked as usual. *Creagris plagatus* Navas is also *C. mortifer*.

Myrmeleon africanus Rbr.

A *Creagris* as identified by all; marked (prob. by McLachlan) as equal to *luteipennis* Burm. There are 5 to 7 cross-veins before radial sector in fore wing, 11 branches of radial sector, 11 to 13 cross-veins between anal and cubital in fore wing.

Creagris nigrostriatus McLach.

Is a *Creagris*, spurs about equal to first tarsal joint which is very long; antennæ close together; 7 cross-veins before the radial sector in fore wings, 11 branches to radial sector (McLachlan collection).

Myrmeleon lineosus Rbr.

Is probably a *Myrmecælurus* and not a *Nesoleon*, but legs gone, and type much broken. Fore wing has 9 cross-veins before radial sector, 6 in hind wings, anal connected to cubital fork five times, 9 branches to radial sector; in fore wings the radial sector arises a little farther out than end of anal vein.

Myrmecælurus lobatus Navas.

Is *M. latus* Klug; it occurs also in Abyssinia.

Myrmecælurus lachlani Navas.

Is *M. (Myrmeleon) quedenfeldti* Kolbe; hardly more than a local race of *M. trigrammus*.

Myrmeleon atomarius Rbr.

Is a *Myrmecælurus*, and the species I described as *M. subcostatus*. Wings dotted all over, and in fore wing a short brown streak near apex, in hind wing faintly indicated. *Myrmecælurus apicalis* Navas is the same.

Myrmecælurus sectorius Navas.

A narrow brown margin, except in front where the subcosta is margined brown; an apical streak in fore wings.

Bankisus oculatus Navas.

No spurs, legs very slender; one cross-vein in hind wing before the radial sector, in the fore wing three cross-veins.

Nelees lucasi Navas.

Runs to *Megistopus*, but the fourth joint of tarsus is short, second and third as long as first, legs very slender, spurs as long as the first tarsal joint. Antennæ close together at base. Wings narrow; anal runs far out in fore wings, and in hind wings not quite so far.

Myrmeleon callidus Walk.

A *Neuroleon*, three black stripes on the pronotum; 7 cross-veins before radial sector in fore wings, 11 branches of the radial sector; a dark line up from end of anal, and obliquely near tip.

Gandulus leptogaster Navas.

This is *Neuroleon filiformis* Gerst.

Neuroleon angustus Navas.

This is *N. alcidice* Bks.

Cymothales johnstoni Kirby.

Marks of wings as figured; antennæ black on basal joint, then pale, till near the tip where last few joints are brown; six or seven cross-veins before radial sector in fore wing; two in the hind wing, eight branches of radial sector, the seventh branch soon forks.

Cymothales eccentros Walk.

Marks of wings as in figure; *C. speciosus* Gerst. is very close to it, but the stigmal mark is large and encloses a pale spot, while the two pale spots in the apical mark are more widely separated, and the upper mark of the median stripe is more rounded and contains a pale spot, and the basal band is entire. The color of the antennæ and femur I is alike in the two species.

Cymothales bouvieri v. d. Weele.

The type has three cross-veins before radial sector in fore wings; there are ten branches to the radial sector, the fourth branch soon forked. The pronotum is dark, with two pale parallel lines, a submarginal pale line each side, and an oblique line from the middle of the submedian lines to the outer posterior corner.

Nesoleon.

A great number of species have been described in this genus, but many are synonyms.

Nesoleon variegatus Klug.

Is as I have identified it, very similar to *N. mysteriosus* Gerst., but not as heavily marked, and not showing the pale subapical streaks in the wings; the face mark is about the same, but the branches of the interantennal mark do not enclose a spot as in *N. mysteriosus*.

Nesoleon virgatus Klug.

Is practically the same as *N. variegatus*, but the wings are paler and less marked; the lateral stripe of thorax above is broad.

Nesoleon pallens Klug.

Is as I have identified it; the abdomen has a narrow dark median stripe, as in figure.

Nesoleon lepidus Klug.

Is very similar to *N. pallens*, but the abdominal marks are different; the segments having a mark extending along the posterior sides, as in figure.

Nesoleon erythræus Navas.

= *N. pallens*.

Nesoleon interruptus Navas and N. divisus Navas are both

N. variegatus (Brit. Mus.).

Nesoleon rimatus Navas (Paris Mus.).

= *N. variegatus*.

Nesoleon cognatus Navas.

= *N. pallens*.

Nesoleon scalaris Navas.

= *N. lepidus*.

Myrmeleon punctulatus Oliv.

Is a *Nesoleon*, and agrees with *N. pallens*.

Myrmeleon abyssinicus Klap.

= *Nesoleon pallens*.

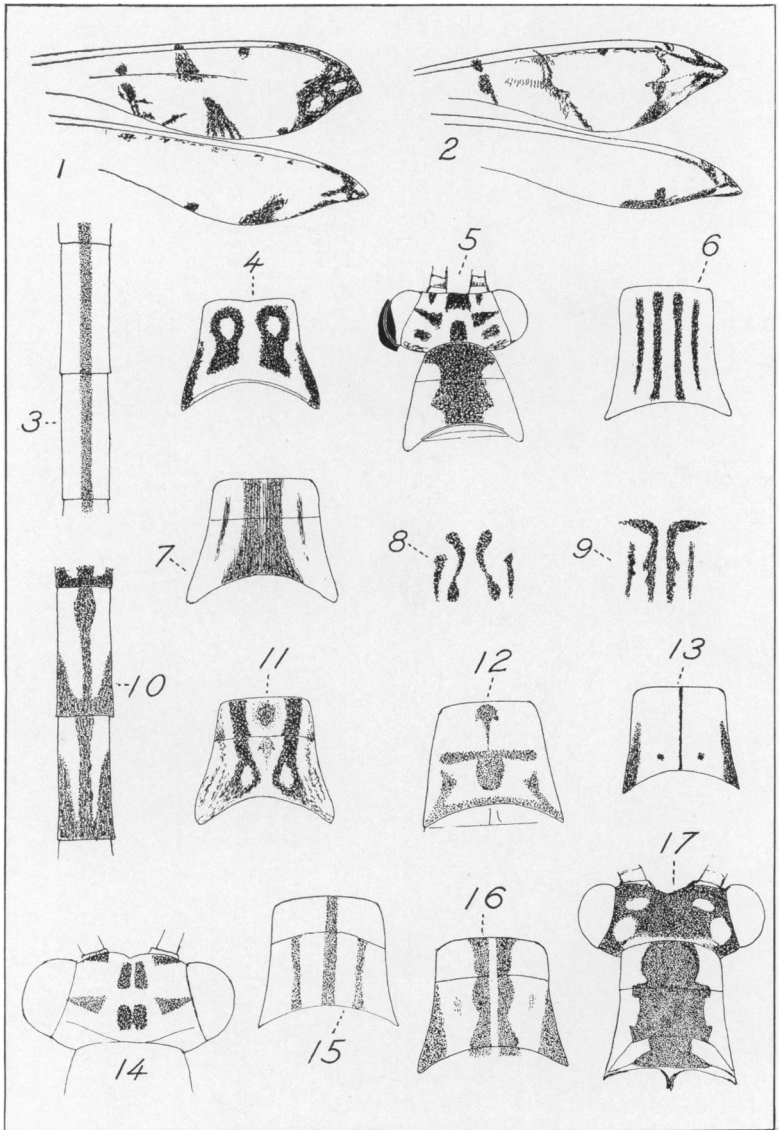
Myrmeleon pertennis Klap.

Agrees with *Nesoleon variegatus*.

I have still another species of this genus which I have not seen in any of the European collections.

Nesoleon tumidus new species.

In general marked like *N. mysteriosus* Gerst. but hardly as heavily, and the pale area in apex of wings is therefore not as prominent. The wings are as broad as in that species, and the outer margin more rounded; there is no mark up from end of anal vein; the pronotum not as slender as in *N. mysteriosus*, but with the three stripes complete; the vertex has a black cross, the front with a large black spot extending much below the antennæ and covering the front of the vertex; the thoracic marks as in *N. mysteriosus* but broader; abdomen lined on base, beyond dark; legs more heavily marked than in *N.*



African Myrmeleonidæ.

mysteriosus, the hind femora dark on outer side, and tibia with a black line within; 11 or 12 cross-veins before radial sector in each wing, 11 branches of radial sector. It differs from *N. mysteriosus* not only in lacking the pale spot below antennæ, but from this and all other species of the genus I have seen in the greatly swollen vertex, fully twice as high as in *N. mysteriosus*.

Expanse 74 mm.

From Harrar, Abyssinia (Kristensen).

EXPLANATION OF PLATE.

- Fig. 1. *Cymothales eccentricus*, wings.
 Fig. 2. *Cymothales johnstoni*, wings.
 Fig. 3. *Nesoleon pallens*, abdomen.
 Fig. 4. *Myrmeleon pulverulentus*, pronotum.
 Fig. 5. *Myrmeleon ochroneurus*, pronotum.
 Fig. 6. *Phanoclisia longicollis*, pronotum.
 Fig. 7. *Acanthaclisis distincta*, pronotum.
 Fig. 8. *Creagriss mortifer*, pronotal marks.
 Fig. 9. *Creagriss cinerascens*, pronotal marks.
 Fig. 10. *Nesoleon lepidus*, abdomen.
 Fig. 11. *Acanthaclisis longicornis*, pronotum.
 Fig. 12. *Myrmeleon cinereus*, pronotum.
 Fig. 13. *Myrmeleon infidus*, pronotum.
 Fig. 14. *Myrmeleon fasciatus*, pronotum.
 Fig. 15. *Myrmecalurus latus*, pronotum.
 Fig. 16. *Formicaleon diversus*, pronotum.
 Fig. 17. *Myrmeleon lethifer*, pronotum.

MISCELLANEOUS NOTES.

Note on *Phanæus Torrens Lec.*—In 1847, in the Journ. Acad. Nat. Sci. Phila., Ser. 2, Vol. 1, p. 85, Dr. Leconte described as new *Phanæus torrens* in the following words: "Cupreus, subnitidus, subtiliter rugosus, clypeo ♂ postice breviter cornuto, thoracis disco triangulariter planato; elytris obsolete punctatis, profunde striatis, striis basi dilatatis. ♂ Long. .59; lat. .42. ♀ Long. .74; lat. .46.

"Varietatibus quibusdam *P. nigrocyanæ* (McLeay) similis, at interstitiis elytrorum convexioribus, vix conspicue punctatis, necnon colore cupreo distinctus. Habitat ad urbem St. Louis, a Dom. Engelmann datus.

"Supra læte cupreus, subtus nigro-æneus. Clypeus rotundatus,