

**Genus *Merodon* Meigen, 1803
(Diptera: Syrphidae)**



Subgeneric division

**– morphological and molecular
evidence**

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- With more than 170 species known (Vujić et al., in prep), *Merodon* is one of the largest hoverflies genus.
- A majority of the species are Palearctic, mainly Mediterranean and only few appears in Ethiopian region (especially in South Africa).
- Many species are poorly known and inadequately treated in publications.

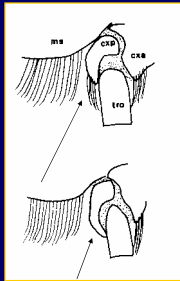


- Hurkmans (1993) has recently clarified the nomenclature and status of 12 species groups (61 species).
- The rest of genus is under revision that will be prepared in near future (Vujić et al., in prep.).

- The previous revisions of genus are based on external similarities (Becker, 1912; Sack, 1913; Paramonov, 1926).
- Hurkmans, 1993 includes male genitalia.
- Until now, only one subgenus was described based on dichoptic condition in males, *Exmerodon* Becker, 1912.

- The aims of this study was to investigate the subgeneric structure of genus *Merodon* based on morphological and molecular data.
- For this purpose 48 representatives of almost all known *Merodon* species groups were analysed.
- The morphological dataset is presented, including external characters and mainly male genitalia features

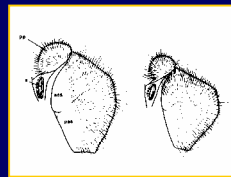
Morphological characters and character states for analysing relationships among *Merodon* species-groups



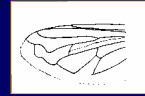
Posterior side of mid coxa:
(0) with hairs (at least one); (1) bare. This character is very informative and present one of the most important features in subgeneric classification of genus *Merodon*



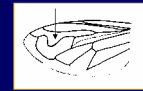
Hairs on pleurae (anterior anepisternum): (0) occupies large area; (1) partly reduced; (2) triangular bare area with reduced hairs.



Eumerus sp

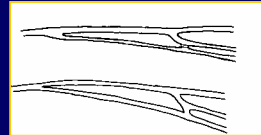


Eumerus sp



Merodon sp

• **Veins Sc and R1 (pterostigma):** connected with short vein.

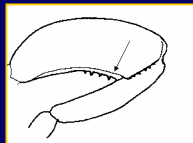


Vein R 4+5: strongly sinuate

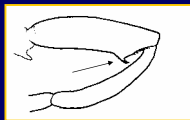
• **Apico-lateral margin of hind femur:** (0) without triangular plate or expressed structures; (1) with triangular plate; (2) with strongly dentate plate; (3) with plate armed with one strong apical thorn.



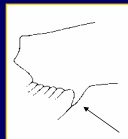
Eumerus sp



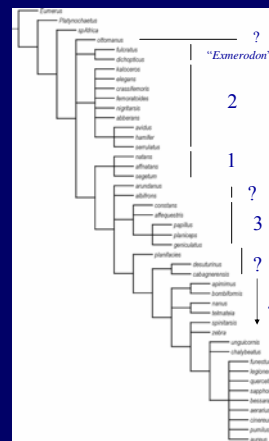
Eumerus sp



Merodon aureus

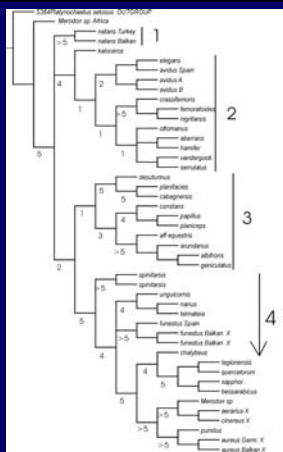


Merodon bombiformis



• **Morphological dataset (17 characters)** analysed using fitch optimization, e.g. multistate morphological characters treated as unordered.

• Three trees, and a strict consensus of these is in the figure (length = 39 steps, CI=0.71, RI=0.92).



• **Morphological and molecular COI characters combined (morphological as unordered).**

• **Strict consensus of 6 trees, length 1133 steps, CI=0.34, RI=0.61.** Bremer support values below nodes.

X – data from:
Milankov, Stahls, Vujic:
Molecular diversity of populations of *Merodon aureus* and *M. cinereus* complex on the Balkan Peninsula

Based on combined analysis new subgeneric division of genus *Merodon* is proposed:

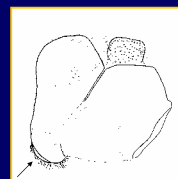
• **Subgenus 1 (*natans* and *segetum* groups)**

• Mixed characters from subgen. 2 and 3
• Posterior side of mid coxa with hairs; hairs on anterior anepisternum reduced; anterior lobe of surstylus oval, hairy



Eumerus sp

Merodon ottomanus



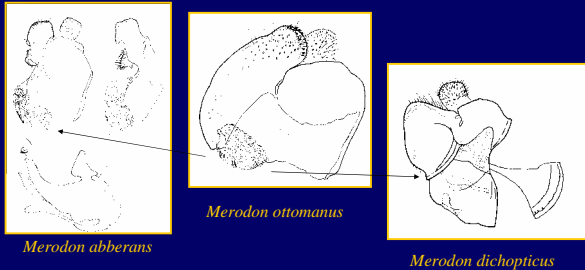
Merodon segetum



Merodon natans

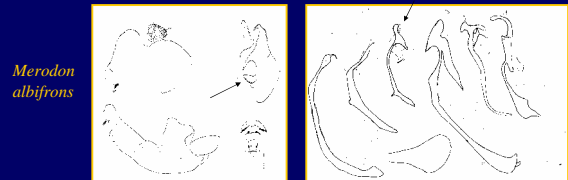
Subgenus 2 (*Merodon* s.str.)

- More or less species from first part of Hurkmans (1993) monograph (plus *hirtus* group, "*Exmerodon*"...)
- Posterior side of mid coxa without hairs
- Hairs on anterior anepisternum vary; anterior lobe of surstylus oval, hairy (short, elongated, reduced)



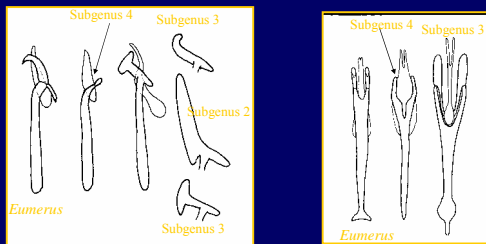
Subgenus 3 (*desaturinus* and *albifrons* groups)

- Posterior side of mid coxa with hairs; anterior lobe of surstylus curved innerly.
- Hairs on anterior anepisternum reduced in *albifrons* group and variable in *desaturinus* group.
- *desaturinus* group contains morphologically different species, but always with top of lateral sclerite of aedeagus pointed and projected dorsally; distribution, mainly South Africa and south Palaearctic.
- *albifrons* group includes many different subgroups: *equestris*, *ruficornis*, *geniculatus*, *rufus*, *albifrons* s. str. ...

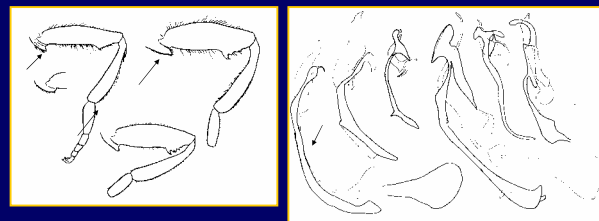


Subgenus 4 (*aureus*, *funestus*, *nanus*, *spinitarsis*, *zebra*, *bombiformis* groups)

- Posterior side of mid coxa with hairs; hairs on anterior anepisternum occupies large area; anterior lobe of surstylus reduced or undeveloped; lateral sclerite of aedeagus partly or completely reduced.



- *aureus* group includes high number of species with thorn on hind trochanter and elongated and theca very narrow after basal fifth (male genitalia inseparable between species).



- *funestus* group: thorn on hind trochanter; lateral sclerite of aedeagus partly reduced.
- *nanus* and *spinitarsis* groups: hind trochanter without thorn; male genitalia distinct.
- *zebra* group: African species with male genitalia similar to *aureus* and *funestus* groups
- *bombiformis* group: apico-lateral margin of hind femur with plate armed with one strong apical thorn; distribution Africa.

