

Table 2. Diagnostic characters of exuviae of African species of the genera *Crenigomphus* and *Paragomphus*. **Head and mouth parts** — Hdw: head width; An4, An3: lengths of antennomeres 4 and 3; 4/3: ratio of antennomeres 4/3; PL: length of prementum; PW: width of prementum; L/W: prementum length/width ratio; MI: width of anterior median lobe of prementum; MI/P: median lobe width/prementum width ratio; Lp: serration of labial palps; **Abdomen** — Dors: abdominal segments with clearly visible

Species	Hdw	An4	An3	4/3	PL	PW	L/W	MI	MI/P	Lp	Dors	Lat	Setae	S10	P	C	P/10	C/P
<i>C. cornutus</i>	4.2	0.40	1.14	0.35	3.10	2.12	1.4	0.82	0.3	weak	2-9	2-9	dense	1.43	2.60	2.50	1.8	1.0
<i>C. hartmanni</i>	4.8	0.30	1.45	0.2	3.18	2.45	1.3	0.98	0.4	weak	2-9	6-9	single	1.47	1.88	1.88	1.3	1.0
<i>C. kavangoensis</i>	4.1	0.18	1.18	0.15	2.93	2.20	1.3	0.71	0.3	weak	2-9	2-9	sparse	1.26	1.76	1.76	1.4	1.0
<i>P. acuminatus*</i>	4.1	0.43	1.45	0.3	4.16	2.45	1.7	0.73	0.3	weak	2-9	2-9	sparse	0.32	3.02	2.69	9.6	0.9
<i>P. alluaudi</i>	4.1	0.38	1.20	0.3	3.43	2.53	1.35	1.10	0.4	weak	2(-3)	6-9	sparse	1.26	1.67	1.59	1.3	1.0
<i>P. cataractae</i>	4.1	0.28	0.90	0.3	2.73	2.29	1.2	0.73	0.3	weak	2-3	2-9	very dense	1.26	2.04	1.96	1.6	1.0
<i>P. cognatus*</i>	4.1	0.25	0.88	0.3	3.10	2.20	1.4	0.73	0.3	weak	2-3	7-9	sparse	1.37	1.88	1.71	1.4	0.9
<i>P. crenigomphoides</i>	4.6	0.30	1.33	0.3	3.59	2.69	1.3	1.14	0.4	weak	no	5-9	sparse	1.47	1.51	1.55	1.0	1.0
<i>P. elpidius*</i>	4.1	0.25	1.05	0.2	3.10	2.22	1.4	0.69	0.3	weak	2-3	6-10	sparse	1.31	1.96	1.89	1.5	1.0
<i>P. genei</i>	4.5	0.35	1.40	0.25	3.10	2.53	1.2	1.14	0.45	weak	2-3	5-9	dense	1.26	2.04	1.88	1.6	0.9
<i>P. nyasicus</i>	4.4	0.23	1.15	0.2	2.78	2.29	1.2	0.71	0.3	clear	2-3	5-9	sparse	1.58	2.29	1.88	1.4	0.8
<i>P. sabicus*</i>	4.6	0.25	1.45	0.2	3.06	2.12	1.4	0.86	0.4	strong	2-4	3-9	dense	1.16	3.10	1.59	2.7	0.5

The species, especially males, of the regional southwestern African *Crenigomphus* and *Paragomphus* may be distinguished from the following key:

1. Upper appendages only slightly longer than epiproct; larger species, total length ca 50 mm 2
- 1'. Upper appendages ca 2x as long as epiproct; mainly smaller species, total length < 50 mm 3
2. No foliations on S8-9 in both sexes *C. cornutus*
- 2'. Foliations on S8-9 in both sexes *C. hartmanni*
3. No foliations on S8-9 in both sexes *C. kavangoensis*
- 3'. Foliations on S8-9 in both sexes 4
4. Thorax bright to pale green with brown or without markings 5
- 4'. Thorax yellow with brownish or black markings 7
5. Thorax bright green without markings *P. cataractae*
- 5'. Thorax bright to pale green with dark (black or brown) markings 6
6. Pterostigma dark brown; thorax bright green with dark brown markings; hamulus not hammer-shaped *P. elpidius*

dorsal spines or hooks (Note: sometimes scarcely visible spines occur on segments, which were not counted); Lat: abdominal segments with clearly visible lateral spines; Setae: density of long setae at posterior edges of the tergites; S10: length of abdominal segment 10 (from ventral); P: length of paraproct; C: length of right cercus; P/10: ratio length paraproct/length S10; C/P: cercus length/paraproct length ratio. All measures are in mm. In species marked with an asterisk, larval identities are not yet confirmed.

- 6'. Pterostigma pale brown; thorax mostly pale green with dull brown markings; hamulus hammer-shaped *P. genei*
7. Thorax as well as abdomen with clearly contrasting black markings; males with very prominent foliations, foliation span 2x as wide as the length of S8; body length >> 50 mm *P. sabicus*
- 7'. Only thorax with clearly contrasting markings; males with much smaller foliations; body length < 50 mm *P. cognatus*

The larvae of the known African species of *Crenigomphus* and *Paragomphus* may be separated by morphometric characters (Table 2).

Notes on biology and distribution

Besides the type locality, *C. kavangoensis* has been encountered at seven localities all along the river section from west of Nkurenkuru, where the border between Namibia and Angola starts, downstream to Andara (Fig. 3). In the upstream area *C. kavangoensis* was often the most common gomphid. It was present along rather degraded sections of the riverbanks, where several other species of dragonflies were absent. *C. kavangoensis* may perhaps profit from deforestation along the