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Preliminary results on the biometry of Italian Trichoptera fauna

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Abstract A biometric study was carried out on the winged Trichoptera fauna of the entire Italian peninsula. It covered 191 taxa from five families: Rhyacophilidae (33 taxa), Glossosomatidae (11), Hydrophilidae (36), Hydropsychidae (19) and Limnephilidae (92). The specimens examined are in the "GP Moretti Collection", which, at present, represents 90% of the Italian taxa.

Key words: Trichoptera, Italy, biometric data base

A biometric investigation was carried out on the winged Trichoptera fauna of the entire Italian peninsula with the aim of providing an analytical inventory of measurements of the 365 species and 30 subspecies. The specimens studied were those of the "GP Moretti Collection" which includes 90% of known Italian taxa (MORETTI et al. 1997). In this study 191 taxa from five families of the three main taxonomic groups were studied (WIGGINS & WICHARD 1989; WICHARD 1991; WICHARD et al. 1997): *ANNULIPALPIA*-Hydropsychidae (19 taxa); *SPICIPALPIA*-Glossosomatidae (11), Hydroptilidae (36) and Rhyacophilidae (33); *INTEGRIPALPIA*-Limnephilidae (92).

A maximum of six individuals, male and female, from each taxon were examined for their northern, central and southern distribution and the following morphological parameters recorded: head width and lengths of forewing, head-forewing, head-abdomen, metafemur, maxillary palp, labial palp (Fig. 1).

Table 1 reports the mean values for these parameters for the specimens of each taxon examined and, in addition, the more significant basic statistical data for the five families considered. At times, because of the limited number of individuals for each species studied, only data on biometric indications, and not on population variability, could be obtained. Forewing length is the parameter most often used for identifying the dimensional interval of species (MALICKY 1983; NEBOISS 1986). On this basis, all taxa with a forewing measurements of less than about 4 mm belong to the Italian microtrichoptera group, which, with the exception of *Agraylea* and *Allotrichia*, are represented only by the Hydroptilidae genera (Fig. 2).

The dimensional differences between male and female forewings are given for each taxon in Fig. 3, but, naturally, only the taxa where couples of examples originating from the same geographic area were available.

Of the seven parameters examined, the dimensional relationship between ♂/♀ is a measure of sexual dimorphism. Comparison of the five families examined reveals that the mean ratio for the morphometric parameters is 0.96.

On the basis of the information from the five families examined, it is our intention to continue the investigation and extend it to all Italian Trichoptera. We consider the biometric data base of the species an useful body of knowledge for characterizing both populations and their interactions.

Acknowledgement

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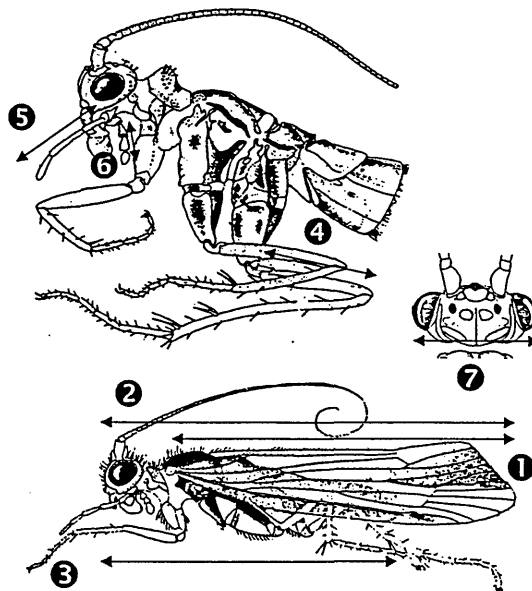


Fig. 1. Drawing of the parameters measured (accurate to 0.025 mm): (1) length of anterior wing, (2) head + anterior wing, (3) head + abdomen, (4) metafemur, (5) maxillary palp, (6) labial palp, (7) width of head.

Table 1 (pages 16-17): Mean values of morphological parameters of 191 taxa investigated. Mean, standard deviation, minimum and maximum values of five Families.

N. TAXA		FOREWING (mm)	HEAD (mm)	FOREWING (mm)	HEAD (mm)	WIDTH (mm)	MAJILLARY PAIP (mm)	LABIAL PAIP (mm)	META-FEMUR (mm)	HEAD-ABOUMEN (mm)	MALES	FEMALES
RHYACOPHILIDAE												
1	<i>Rhyacophila eppamirina</i>	14.75	18.45	2.21	2.94	1.33	3.35	12.55	2	0		
2	<i>Rhyacophila equitana</i>	7.35	8.30	1.13	1.31	0.68	1.64	5.95	1	1		
3	<i>Rhyacophila arcangelina</i>	14.80	16.30	1.98	2.63	1.18	3.15	13.80	1	0		
4	<i>Rhyacophila aurata</i>	12.05	14.00	1.83	2.19	1.01	2.68	11.00	1	1		
5	<i>Rhyacophila dorsalis acutidens</i>	10.60	12.00	1.63	2.03	1.00	2.30	9.40	1	0		
6	<i>Rhyacophila dorsalis dorsalis</i>	11.10	13.10	1.79	2.21	0.93	2.43	11.35	1	1		
7	<i>Rhyacophila dorsalis subacutidens</i>	10.57	12.25	1.70	2.03	0.97	2.40	8.90	2	1		
8	<i>Rhyacophila fasciata</i>	9.78	11.30	1.73	1.90	0.83	2.30	8.80	1	0		
9	<i>Rhyacophila foliacea</i>	13.45	15.35	2.10	2.84	1.15	2.73	10.95	1	1		
10	<i>Rhyacophila hartigi</i>	12.05	14.15	1.90	2.26	1.00	2.68	11.00	1	1		
11	<i>Rhyacophila hirticornis orobica</i>	9.80	11.70	1.50	2.05	—	2.38	8.90	1	0		
12	<i>Rhyacophila intermedia</i>	13.90	15.85	1.85	2.44	1.28	2.75	11.40	1	1		
13	<i>Rhyacophila italica itivana</i>	11.90	14.40	2.15	2.35	1.05	2.80	13.80	1	0		
14	<i>Rhyacophila italica italica</i>	13.53	15.83	2.04	2.41	1.13	2.93	13.05	2	2		
15	<i>Rhyacophila kelnerae</i>	9.45	10.85	1.33	2.09	0.90	2.13	8.95	2	2		
16	<i>Rhyacophila laevis</i>	6.70	7.40	1.06	1.16	0.49	1.55	—	2	0		
17	<i>Rhyacophila meyeri</i>	8.73	9.98	1.24	1.69	0.74	1.88	7.75	2	2		
18	<i>Rhyacophila pallida</i>	11.70	13.20	1.80	2.44	1.08	2.70	12.55	1	1		
19	<i>Rhyacophila nubila</i>	10.50	12.20	1.80	1.95	0.93	2.50	9.30	1	0		
20	<i>Rhyacophila palmeri</i>	10.80	12.60	1.75	1.98	1.03	2.40	—	1	0		
21	<i>Rhyacophila pascoei</i>	11.05	12.50	1.91	1.94	0.86	2.45	10.20	1	1		
22	<i>Rhyacophila praemorsa</i>	13.45	15.05	1.88	2.49	1.03	2.90	—	1	1		
23	<i>Rhyacophila pubescens</i>	8.50	9.82	1.38	1.61	0.70	1.78	7.35	3	2		
24	<i>Rhyacophila ravizani</i>	14.10	16.15	1.96	2.61	1.11	2.85	12.00	1	1		
25	<i>Rhyacophila rectispina</i>	12.60	14.20	2.00	2.70	1.15	3.15	14.30	1	0		
26	<i>Rhyacophila rougemonti</i>	12.90	14.60	1.91	2.37	1.11	2.75	12.53	2	2		
27	<i>Rhyacophila simulatrix</i>	13.38	15.50	2.04	2.52	1.14	2.75	11.53	2	2		
28	<i>Rhyacophila stigmatica</i>	10.70	11.60	1.34	2.01	0.89	2.10	8.50	1	1		
29	<i>Rhyacophila tormentum</i>	15.45	17.85	2.04	2.58	1.18	3.10	12.50	1	1		
30	<i>Rhyacophila trifasciata</i>	13.55	16.20	2.03	2.13	1.00	2.80	16.00	1	1		
31	<i>Rhyacophila tristis</i>	7.46	8.60	1.15	1.59	0.79	1.63	6.98	2	3		
32	<i>Rhyacophila vellei</i>	10.20	11.40	1.78	1.70	0.74	2.33	—	1	1		
33	<i>Rhyacophila vulgaris</i>	13.18	14.90	1.96	2.46	0.97	2.73	10.93	2	2		
		MEAN	11.51	13.20	1.76	2.16	0.98	2.51	10.80			
		MAX	15.45	17.95	2.21	2.94	3.35	16.00				
		MIN	6.70	7.40	1.06	1.16	0.49	1.55	5.95			
		S.D.	2.26	2.61	0.32	0.41	0.19	0.48	2.38			
GLOSSOSOMATIDAE												
34	<i>Glossosoma bifidum</i>	7.40	8.50	1.34	1.38	0.53	1.56	6.95	1	1		
35	<i>Glossosoma bolloni</i>	6.80	7.40	1.18	1.20	0.48	1.35	5.00	1	0		
36	<i>Glossosoma conformis</i>	8.03	9.03	1.31	1.38	0.58	1.64	6.34	3	3		
37	<i>Catagapetus nigrans</i>	5.35	6.22	0.92	0.95	0.43	1.11	4.77	3	3		
38	<i>Syngapetus dubians</i>	5.10	5.65	0.83	0.81	0.36	1.05	4.65	1	1		
39	<i>Agapetus cyrensis</i>	4.00	4.75	0.75	0.61	0.29	0.98	3.65	1	1		
40	<i>Agapetus delicatulus</i>	5.20	6.15	0.85	0.80	0.41	1.08	4.50	1	1		
41	<i>Agapetus fuscipes</i>	4.05	4.80	0.69	0.51	0.25	0.76	3.70	1	1		
42	<i>Agapetus incertulus</i>	4.40	5.60	0.83	0.65	0.30	0.90	—	1	0		
43	<i>Agapetus leniger</i>	5.37	6.17	0.89	0.74	0.32	1.05	4.40	3	3		
44	<i>Agapetus nimbulus</i>	4.45	5.18	0.75	0.63	0.30	0.85	3.94	3	3		
		MEAN	5.47	6.31	0.95	0.86	0.98	1.12	4.78			
		MAX	8.03	9.03	1.34	1.38	1.56	1.64	6.95			
		MIN	4.00	4.75	0.69	0.51	0.25	0.76	3.65			
		S.D.	1.37	1.43	0.23	0.31	0.10	0.28	1.08			
HYDROPTILIDAE												
45	<i>Philocolepus granulatus</i>	3.68	4.52	0.66	0.65	0.30	0.79	3.50	3	3		
46	<i>Stactobia caspersi</i>	1.93	1.93	0.35	—	—	0.45	2.38	1	0		
47	<i>Stactobia eatonella</i>	1.63	2.10	0.39	0.40	0.21	0.40	2.33	1	1		
48	<i>Stactobia ericeae</i>	2.10	2.55	0.45	0.48	0.23	0.43	2.10	1	0		
49	<i>Stactobia furcata</i>	2.25	2.65	0.39	0.45	0.19	0.50	1.93	1	1		
50	<i>Stactobia fuscicornis</i>	1.85	2.33	0.40	0.43	0.19	0.51	2.11	2	2		
51	<i>Stactobia moseyoti</i>	2.38	2.78	0.39	0.40	0.23	0.48	2.17	3	2		
52	<i>Orthotrichia angustella</i>	2.58	3.00	0.36	0.44	0.25	0.56	2.03	1	1		
53	<i>Orthotrichia costalis</i>	2.38	2.80	0.40	0.41	0.18	0.51	2.10	1	1		
54	<i>Orthotrichia fregatii</i>	2.75	3.18	0.46	0.48	0.23	0.55	2.28	1	1		
55	<i>Oxyethira falcata</i>	3.37	3.76	0.64	0.59	0.29	0.72	3.05	3	2		
56	<i>Oxyethira flavicornis</i>	2.98	3.38	0.48	0.46	0.20	0.56	2.53	1	1		
57	<i>Oxyethira pirisnui</i>	2.40	2.80	0.58	0.53	0.23	0.53	2.40	1	0		
58	<i>Oxyethira simplex</i>	—	—	0.45	—	—	0.53	—	—	1	0	
59	<i>Oxyethira unidentata</i>	3.05	3.60	0.48	0.53	0.25	0.63	—	—	1	0	
60	<i>Hydroptilia aegyptia</i>	2.67	3.03	0.49	0.43	0.22	0.59	2.18	2	1		
61	<i>Hydroptilia angulata</i>	3.00	3.37	0.60	0.54	0.27	0.63	2.60	3	3		
62	<i>Hydroptilia bifurcata</i>	2.45	2.80	0.48	0.35	0.20	0.55	—	—	1	0	
63	<i>Hydroptilia cornuta</i>	2.45	2.85	0.58	0.55	0.23	0.58	2.45	1	0		
64	<i>Hydroptilia flori</i>	3.65	4.33	0.68	0.69	0.25	0.81	3.50	1	1		
65	<i>Hydroptilia forcipata</i>	2.68	3.35	0.54	0.54	0.25	0.63	2.55	1	1		
66	<i>Hydroptilia giudicellorum</i>	2.40	2.80	0.50	0.35	0.20	0.55	—	—	1	0	
67	<i>Hydroptilia insularica</i>	2.55	3.10	0.50	0.49	0.23	0.55	2.60	1	1		
68	<i>Hydroptilia invisa</i>	3.30	3.70	0.63	0.48	—	0.68	—	—	1	0	
69	<i>Hydroptilia marini</i>	3.43	4.00	0.65	0.61	0.32	0.72	3.61	2	2		
70	<i>Hydroptilia occulta</i>	2.80	3.23	0.60	0.58	0.28	0.59	2.73	1	1		
71	<i>Hydroptilia rufi</i>	2.75	3.20	0.51	0.48	0.25	0.55	2.93	2	2		
72	<i>Hydroptilia similis</i>	2.75	3.20	0.55	0.49	0.24	0.55	2.20	3	2		
73	<i>Hydroptilia sparsa</i>	3.20	3.78	0.62	0.62	0.29	0.70	2.80	3	2		
74	<i>Hydroptilia stellifera</i>	3.18	3.77	0.61	0.62	0.26	0.69	2.70	2	1		
75	<i>Hydroptilia threoides</i>	3.22	3.60	0.62	0.53	0.24	0.64	2.43	3	2		
76	<i>Hydroptilia uncinata</i>	2.76	3.23	0.57	0.54	0.27	0.61	2.55	2	2		
77	<i>Hydroptilia vectis</i>	2.48	2.86	0.50	0.48	0.20	0.55	2.46	3	3		
78	<i>Agryptea sexmaculata</i>	4.05	4.55	0.78	0.53	0.25	0.83	3.20	1	0		
79	<i>Allotrichia pallicornis</i>	4.51	5.08	0.76	0.75	0.33	0.89	4.28	2	2		
80	<i>Microptilia minutissima</i>	2.20	2.53	0.43	0.38	0.20	0.48	—	—	1	1	
		MEAN	2.79	3.24	0.53	0.51	0.24	0.60	2.62			
		MAX	4.51	5.08	0.78	0.75	0.33	0.93	4.28			
		MIN	1.63	1.93	0.35	0.35	0.18	0.40	1.93			
		S.D.	0.62	0.70	0.11	0.09	0.04	0.12	0.54			
HYDROPSYCHIDAE												
81	<i>Diplectrona atra</i>	5.95	7.15	1.13	2.06	0.60	1.38	5.05	1	1		
82	<i>Diplectrona felix</i>	7.30	8.60	1.13	2.36	0.76	1.50	5.40	1	1		
83	<i>Diplectrona magna</i>	8.65	9.85	1.43	2.39	0.76	1.96	7.25	2	2		
84	<i>Hydropsyche angustipennis</i>	9.10	10.55	1.59	2.53	0.82	1.91	7.37	3	1		
85	<i>Hydropsyche bulgermanorum</i>	8.10	9.50	1.53	2.40	0.80	1.58	—	—	1	0	
86	<i>Hydropsyche dinarica</i>	13.50	15.80	2.03	3.75	1.20	2.25	—	—	1	0</	

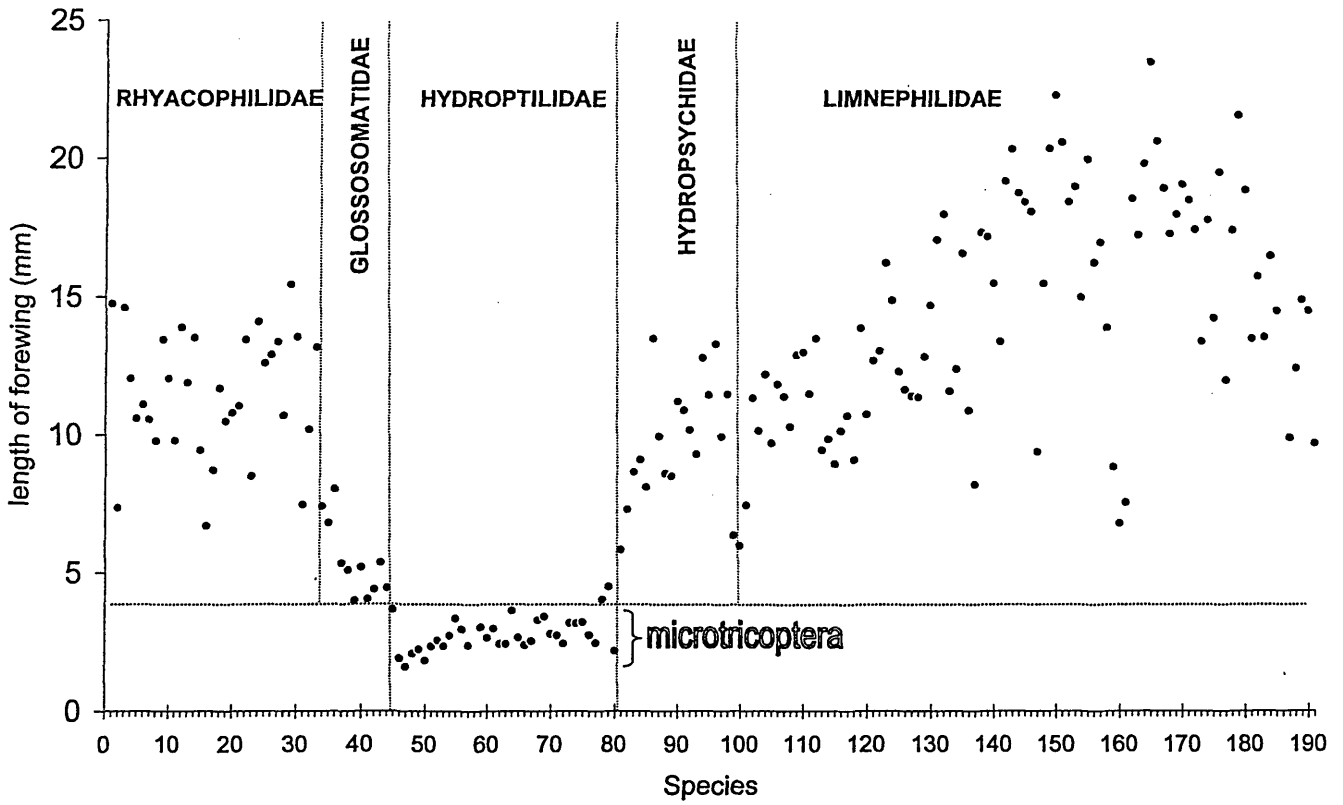


Fig. 2 (above): Mean values for forewing length of the species.

Fig. 3 (below): Forewing length: sex ratio.

