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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): *ANNUPALPIA*- 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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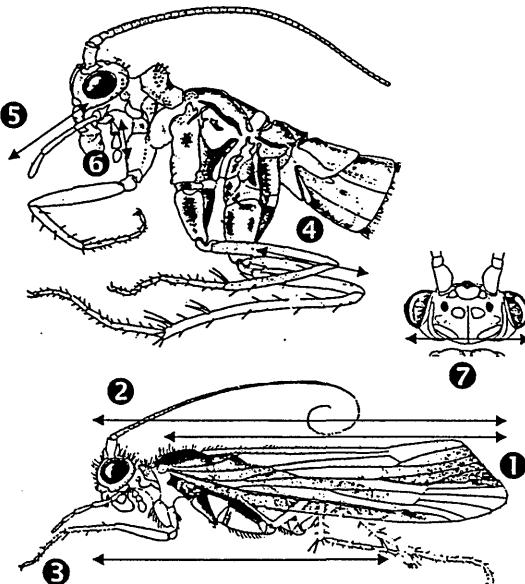


Fig. 1. Drawing of the parameters measured (accurate to 0.025 mm): (1) length of anterior wing, (2) head + anterior wing, (3) head + abdomen, (4) metafemur, (5) maxillary palp, (6) labial palp, (7) width of head.

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		N. TAXA																		
FORWING (mm)	HEAD (mm)	FORWING (mm)	HEAD (mm)																	
MAXILAR (mm)	HELD (mm)	MAXILAR (mm)	HELD (mm)																	
LABIA (mm)	PALP (mm)	LABIA (mm)	PALP (mm)																	
HEAD (mm)	WIDTH (mm)	HEAD (mm)	WIDTH (mm)																	
ABDOMEN (mm)	DEPTH (mm)	ABDOMEN (mm)	DEPTH (mm)																	
MALES	FEMALES	MALES	FEMALES																	
93 <i>Hydropsyche ornata</i>	9.30	11.00	1.68	2.73	0.88	1.85	—	0	1	142 <i>Potamophylax cingulatus alpinus</i>	19.20	21.95	2.43	3.18	1.61	3.98	18.50	1	1	
94 <i>Hydropsyche pellucida</i>	12.80	15.00	2.08	3.78	1.20	2.32	0.92	3	3	143 <i>Potamophylax gambaricus gambaricus</i>	20.35	23.10	2.49	3.35	1.76	4.10	16.00	1	1	
95 <i>Hydropsyche satieri</i>	11.45	13.45	1.84	2.96	1.05	2.23	0.85	1	1	144 <i>Potamophylax gambaricus spinifilis</i>	18.78	21.13	2.40	3.28	1.64	3.64	15.75	2	2	
96 <i>Hydropsyche saxonica</i>	13.30	15.60	2.05	3.70	1.13	2.53	1.17	0	1	145 <i>Potamophylax inermis</i>	18.45	20.90	2.39	3.04	1.50	3.78	13.75	1	1	
97 <i>Hydropsyche spiritalis</i>	9.93	11.57	1.74	3.18	1.06	1.95	0.87	3	3	146 <i>Potamophylax rigicostis</i>	18.10	20.20	2.20	2.73	1.58	3.65	13.50	1	0	
98 <i>Cheumatopsyche tenuis</i>	11.48	13.40	1.78	3.55	1.14	2.09	0.95	3	3	147 <i>Aeophylax zerberus</i>	9.40	10.95	1.74	1.73	0.96	2.50	10.50	1	1	
99 <i>Cheumatopsyche lepida</i>	6.37	7.48	1.09	1.88	0.63	1.23	0.53	3	3	148 <i>Lepidotaulus gracilis</i>	15.50	17.40	1.70	1.83	1.03	2.83	12.40	1	0	
MEAN	9.81	11.52	1.68	2.90	0.95	1.97	0.74			149 <i>Halesus appenninus</i>	20.38	22.63	2.41	2.83	1.63	3.88	17.00	2	2	
MAX	13.50	15.80	2.08	3.78	1.20	2.55	1.17			150 <i>Halesus calabrus</i>	22.30	25.20	2.48	2.98	1.68	3.40	16.70	1	0	
MIN	5.85	7.15	1.09	1.88	0.60	1.23	0.50			151 <i>Halesus digitatus</i>	20.60	23.75	2.25	2.94	1.56	3.75	17.65	1	1	
S.D.	2.18	2.48	0.30	0.58	0.19	0.36	0.98			1845	20.75	2.45	3.18	1.48	3.83	14.40	1	1		
LIMNEPHILIDAE		LIMNEPHILIDAE		LIMNEPHILIDAE		LIMNEPHILIDAE		LIMNEPHILIDAE		LIMNEPHILIDAE		LIMNEPHILIDAE		LIMNEPHILIDAE		LIMNEPHILIDAE				
100 <i>Apalania limbata</i>	6.00	7.20	1.08	0.78	0.40	1.23	5.10	1	0	153 <i>Halesus radiatus</i>	19.00	21.70	2.18	2.88	1.48	3.85	13.70	1	0	
101 <i>Apalania volscorum</i>	7.45	8.80	1.21	1.10	0.45	1.51	6.45	1	1	154 <i>Halesus rubricollis</i>	15.00	17.00	1.91	2.74	1.24	3.13	13.50	1	1	
102 <i>Drusus spiniferus</i>	11.35	13.15	1.56	2.26	0.88	2.56	12.00	1	1	155 <i>Halesus tessellatus</i>	20.00	23.50	2.35	3.63	1.73	3.90	—	0	1	
103 <i>Drusus apennensis</i>	10.15	11.35	1.50	1.53	0.86	2.04	—	1	1	156 <i>Melampophylax malampus</i>	16.27	18.42	1.88	2.71	1.31	3.13	12.78	3	3	
104 <i>Drusus biguttatus</i>	12.20	13.55	1.55	1.81	0.76	2.44	—	1	1	157 <i>Melampophylax vestitum</i>	17.00	19.35	1.89	2.80	1.41	3.08	—	1	1	
105 <i>Drusus camenius</i>	9.70	11.00	1.56	1.54	0.66	0.88	8.05	1	0	158 <i>Anisognathus difformis</i>	13.90	15.70	1.73	2.14	1.23	2.86	—	2	0	
106 <i>Drusus discolor</i>	11.85	13.15	1.69	1.86	0.94	2.46	9.10	1	1	159 <i>Parachionus picicornis</i>	8.85	10.50	1.30	1.20	0.54	1.89	—	1	1	
107 <i>Drusus improbus</i>	11.40	13.30	1.59	1.79	0.80	2.41	9.30	1	1	160 <i>Enocyla costata</i>	6.80	8.50	1.03	0.85	0.45	1.53	5.10	1	0	
108 <i>Drusus melanochaeles</i>	10.30	11.85	1.45	1.85	0.78	2.18	9.10	1	1	161 <i>Enocyla reichenbachii</i>	7.55	8.55	1.00	0.95	0.45	1.60	5.15	2	0	
109 <i>Drusus monticola</i>	12.90	14.90	1.68	1.65	0.78	2.50	—	1	0	162 <i>Stenophylax crossulus</i>	18.75	19.73	2.11	2.93	1.33	3.69	14.93	3	3	
110 <i>Drusus muelleri</i>	13.00	15.70	1.80	2.00	1.05	2.63	12.20	1	0	163 <i>Stenophylax mictorius</i>	19.83	22.38	2.25	3.31	1.58	4.10	16.33	2	2	
111 <i>Eccoptoperla guttulata</i>	11.50	13.05	1.77	1.80	0.93	2.45	9.43	3	3	164 <i>Stenophylax mucronatus</i>	23.50	26.68	2.52	3.80	1.70	4.68	18.93	3	3	
112 <i>Eccoptoperla malickyi</i>	13.50	15.35	1.76	2.34	1.05	2.74	—	1	1	165 <i>Stenophylax permistus</i>	20.63	22.83	2.35	3.48	1.48	4.25	14.27	2	1	
113 <i>Cryptoperla nebulosa</i>	9.45	10.85	1.35	1.78	0.78	1.95	7.80	1	1	167 <i>Microptera fissa</i>	18.95	21.50	2.08	2.91	1.27	3.77	15.00	3	3	
114 <i>Metanoea flavipennis</i>	9.85	11.25	1.36	1.75	0.74	2.08	8.20	1	1	168 <i>Microptera malaspina</i>	17.30	19.45	2.08	2.43	1.14	3.45	—	1	1	
115 <i>Metanoea malatica</i>	8.95	10.20	1.26	1.55	0.71	1.80	7.45	1	1	169 <i>Microptera malatista</i>	18.00	20.00	2.10	2.88	1.30	3.74	15.50	1	1	
116 <i>Leptodinus budzizi</i>	10.15	12.15	1.75	1.96	0.93	2.75	12.15	1	1	170 <i>Microptera nycterobia</i>	19.08	21.46	2.26	2.91	1.42	4.00	16.26	2	3	
117 <i>Monocentra lepidoptera</i>	10.70	12.45	1.61	1.90	0.88	2.31	9.25	1	1	171 <i>Microptera sequax</i>	18.52	20.90	2.29	3.03	1.52	3.95	15.02	3	2	
118 <i>Limnephilus auricula</i>	9.10	10.60	1.34	1.46	0.63	1.75	8.75	1	1	172 <i>Microptera festacea</i>	17.45	19.62	2.00	2.71	1.30	3.39	14.45	3	3	
119 <i>Limnephilus bipunctatus</i>	13.88	16.35	1.91	2.34	1.08	2.96	13.60	2	2	173 <i>Microptera wageneri</i>	13.40	15.40	1.79	2.30	1.15	3.00	12.00	1	1	
120 <i>Limnephilus clivicola</i>	10.75	12.60	1.50	1.70	0.90	2.23	10.00	2	0	174 <i>Mesophylax aspersus</i>	17.80	20.05	1.98	2.78	1.19	3.63	15.38	3	3	
121 <i>Limnephilus coenosus</i>	12.70	14.55	1.73	1.98	1.03	2.58	10.40	1	1	175 <i>Mesophylax serdous</i>	14.25	15.95	1.76	2.38	1.42	3.63	12.50	2	2	
122 <i>Limnephilus exiratus</i>	13.05	14.65	1.68	2.09	0.94	2.59	—	1	1	176 <i>Allogamus antennatus</i>	19.53	22.05	2.33	3.49	1.64	3.63	16.25	2	2	
123 <i>Limnephilus flavicornis</i>	16.23	18.50	2.13	2.79	1.25	3.18	14.58	3	3	177 <i>Allogamus unicolor</i>	12.00	13.65	1.68	2.20	0.94	2.41	10.00	1	1	
124 <i>Limnephilus flavospinosus</i>	14.88	17.35	2.11	2.66	1.28	2.99	17.43	19.80	2	2	178 <i>Allogamus ausoniae</i>	21.57	24.23	2.13	3.13	1.43	3.33	14.83	1	1
125 <i>Limnephilus helveticus</i>	12.30	14.70	1.83	2.34	1.08	2.47	11.33	3	2	179 <i>Allogamus bolcanaeus</i>	18.88	21.38	2.04	3.44	1.54	4.03	17.25	2	1	
126 <i>Limnephilus hirsutus</i>	11.65	13.63	1.69	2.07	0.82	2.45	11.50	2	2	180 <i>Allogamus hilarii hilarii</i>	14.25	15.95	1.76	2.38	1.48	3.63	15.50	2	2	
127 <i>Limnephilus ignavus</i>	11.42	13.35	1.52	1.92	0.83	2.26	10.68	3	3	181 <i>Allogamus hilarii silenus</i>	13.50	15.20	1.78	1.73	1.98	2.63	—	1	0	
128 <i>Limnephilus italicus</i>	11.38	13.25	1.53	1.98	0.88	2.26	10.25	3	2	182 <i>Allogamus illecebrosus</i>	15.75	17.75	2.04	2.65	1.14	3.23	12.75	1	1	
129 <i>Limnephilus flavospinosus</i>	12.84	14.70	1.77	2.30	1.04	2.46	11.76	3	2	183 <i>Allogamus mendax</i>	13.55	15.40	1.73	2.46	1.00	2.85	11.10	1	1	
130 <i>Limnephilus mammorus</i>	14.70	17.20	2.03	2.75	1.18	2.85	13.00	0	1	184 <i>Allogamus uncatus</i>	16.50	18.75	1.95	3.26	1.43	3.33	13.00	1	1	
131 <i>Limnephilus ramentosus</i>	17.08	19.40	2.23	2.78	1.23	3.22	15.40	2	2	185 <i>Consorophylax consors</i>	14.50	16.75	1.94	2.83	1.30	3.15	13.85	1	1	
132 <i>Limnephilus rhombicus rhombicus</i>	18.00	21.00	2.18	2.93	1.33	3.40	17.50	2	2	186 <i>Chaetoplyx euganea</i>	—	—	—	1.85	0.98	—	—	1	0	
133 <i>Limnephilus senecus</i>	11.60	13.80	1.55	2.08	0.93	2.35	11.70	0	1	187 <i>Chaetoplyx fiscacea</i>	9.90	11.70	1.66	1.94	1.11	2.90	—	1	1	
134 <i>Limnephilus sparsus</i>	12.40	14.23	1.60	2.05	0.95	2.54	10.86	3	3	188 <i>Chaetoplyx gessneri tomaszewskii</i>	12.43	14.55	1.81	1.79	1.03	2.81	10.38	3	2	
135 <i>Limnephilus stigmata</i>	16.80	19.00	2.05	2.78	1.38	3.23	13.35	1	1	189 <i>Chaetoplyx trinactae</i>	14.90	17.00	1.90	2.48	1.23	3.19	13.25	1	1	
136 <i>Limnephilus vitriacus</i>	10.90	12.43	1.48	1.59	0.79	2.01	9.20	2	2	190 <i>Chaetoplyx vulture</i>	9.70	11.20	1.59	1.80	0.83	2.58	8.00	1	1	
137 <i>Colpopterulus tristis</i>	8.20	10.05	1.30	1.45	0.85	2.10	10.50	1	1	191 <i>Pseudosiphlonix zimmeri</i>	—	—	—	—	—	—	12.56	—	—	
138 <i>Gammarellus nigropunctatus</i>	17.35	19.80	2.04	2.60	1.23	3.28	14.25	1	1	MEAN	14.49	16.58	1.86	2.37	1.13	2.96	—	—	—	
139 <i>Glyphotaelius pelliculus</i>	17.20	20.20	2.19	3.04	1.36	3.40	16.25	1	1	MAX	23.50	26.68	2.52	3.80	1.76	4.68	19.20	—	—	
140 <i>Anabolia lombarda</i>	15.50	17.70	2.20	2.45	1.38	3.25	12.50	0	1	MIN	6.00	7.20	1.00	0.78	1.23	5.10	11.10	—	—	
141 <i>Radicoleptus aipestris</i>	13.40	15.05	1.68	1.99	0.89	2.40</td														

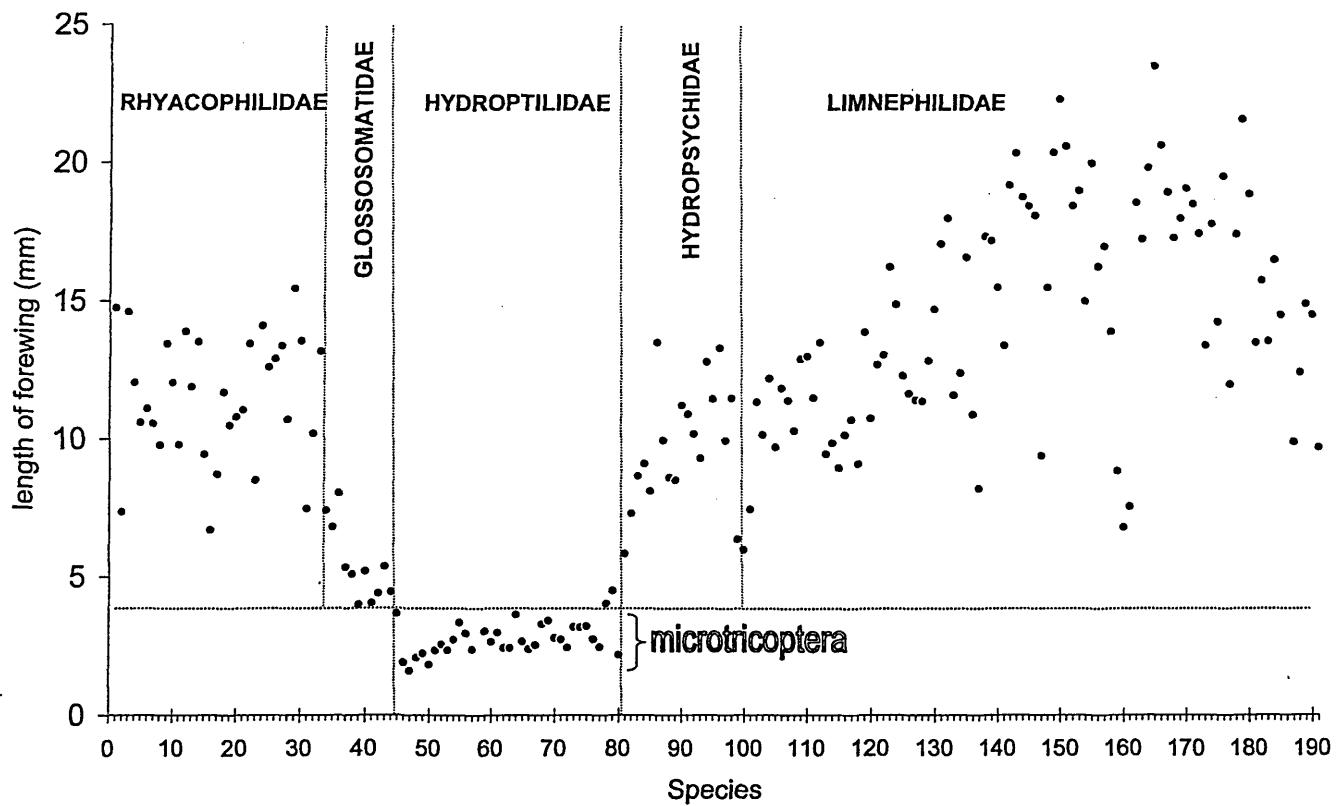
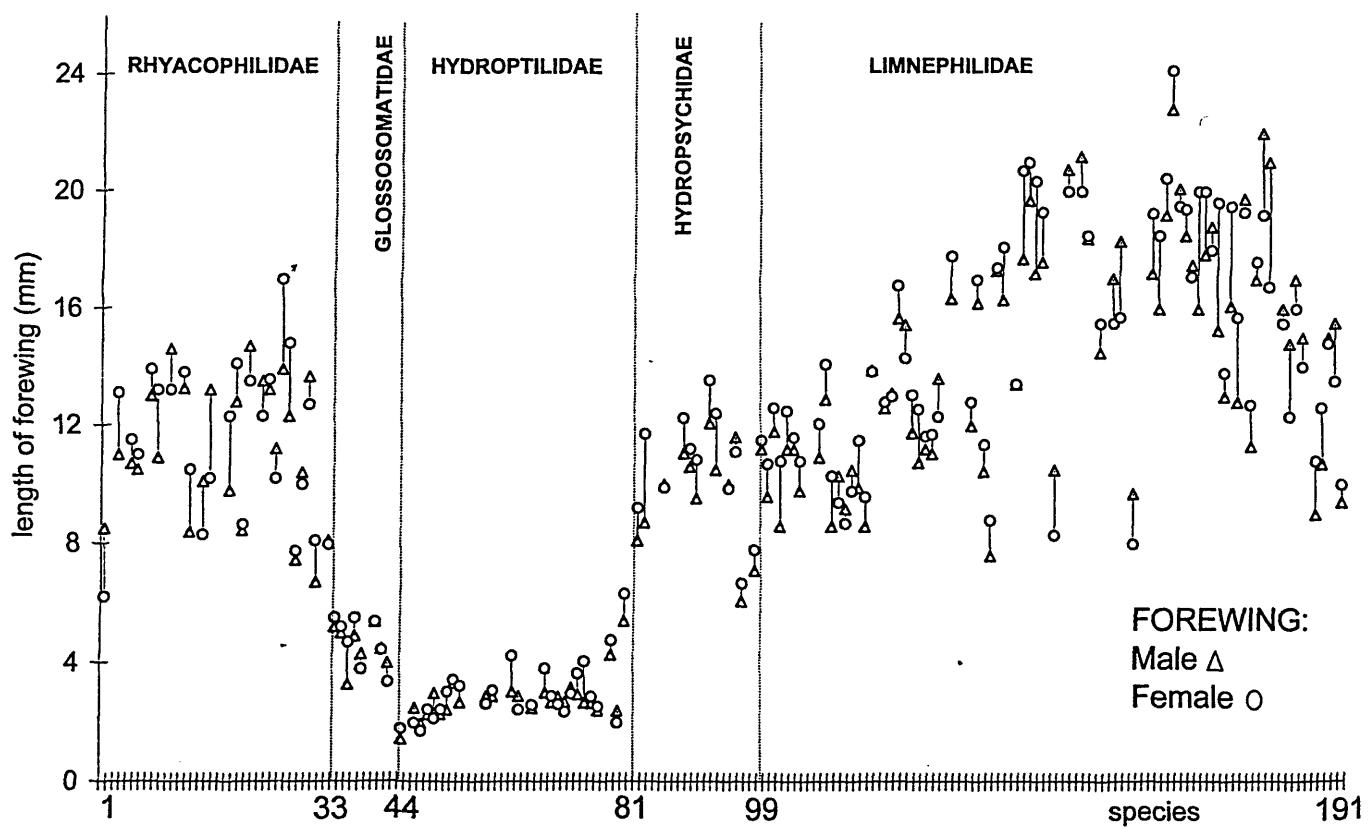


Fig. 2 (above): Mean values for forewing length of the species.

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



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