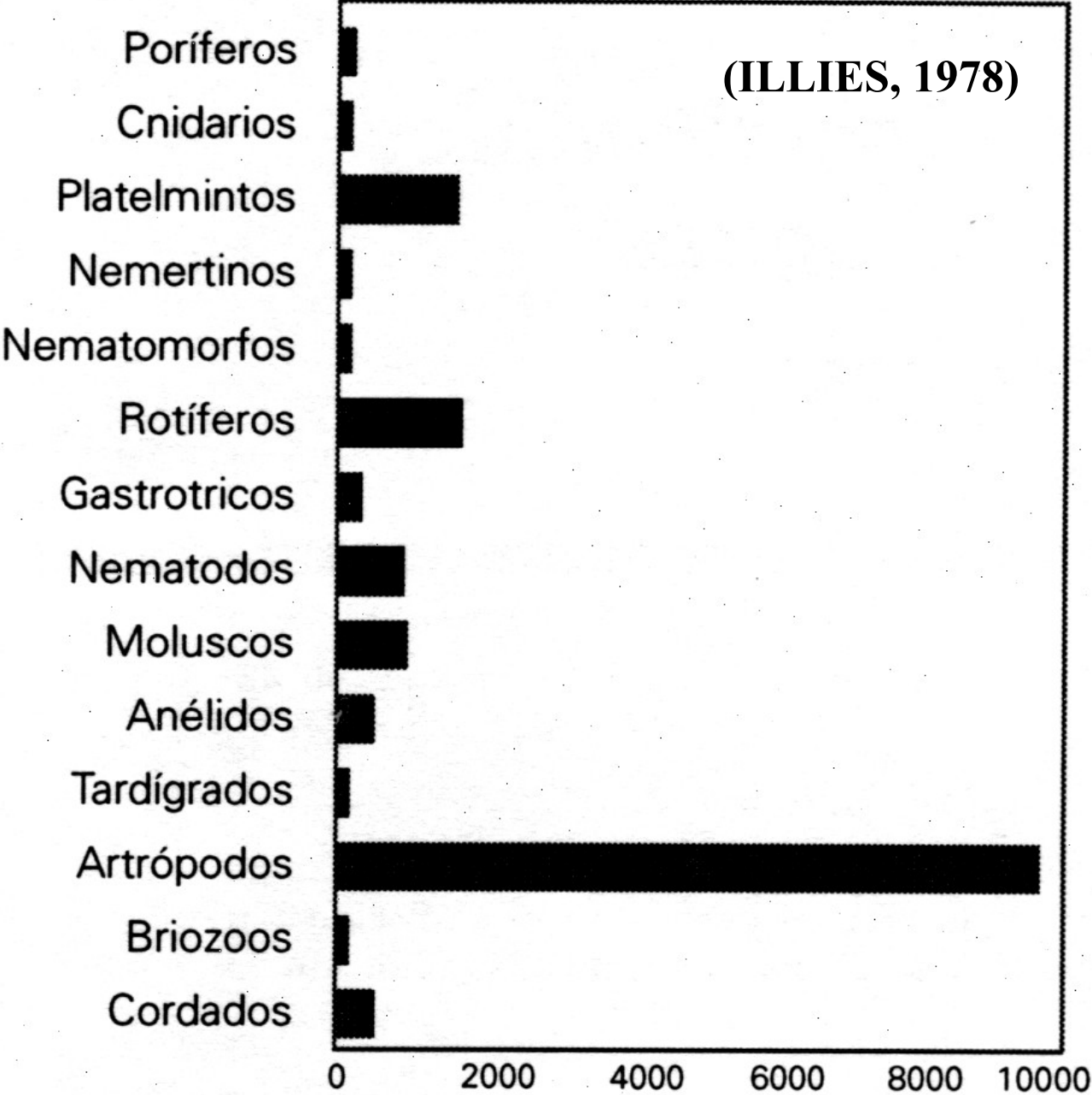
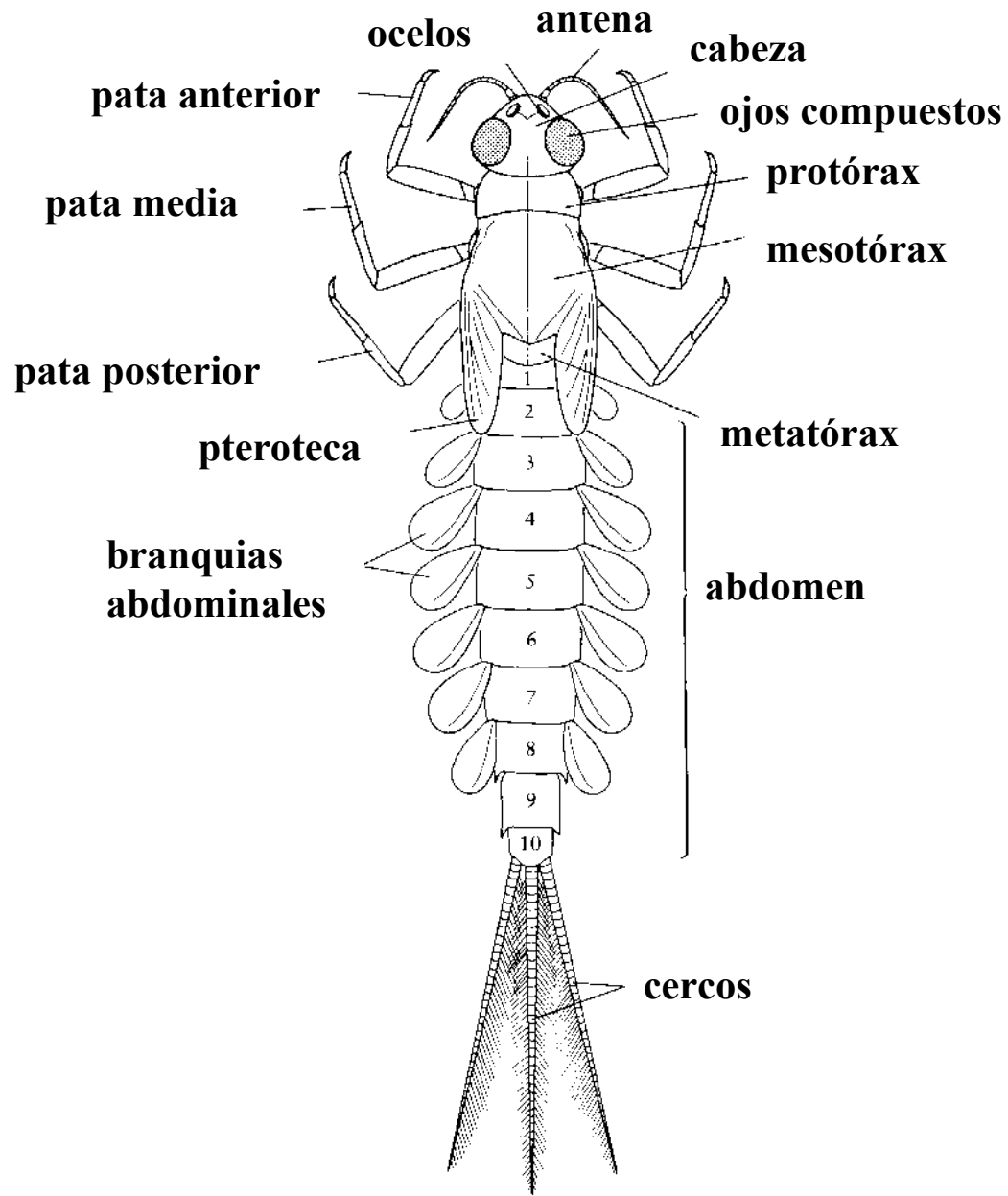


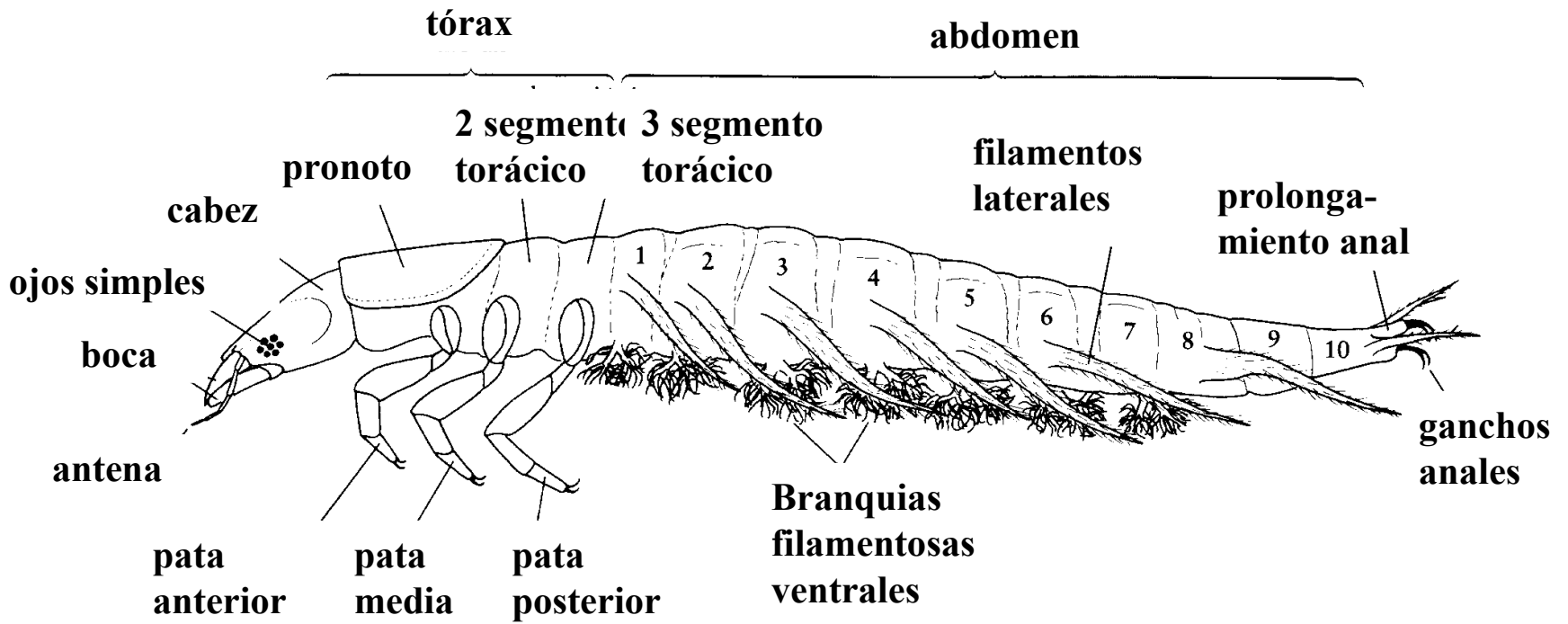
**LOS ARTRÓPODOS COMO  
BIOINDICADORES DE LA CALIDAD DE LAS  
AGUAS**

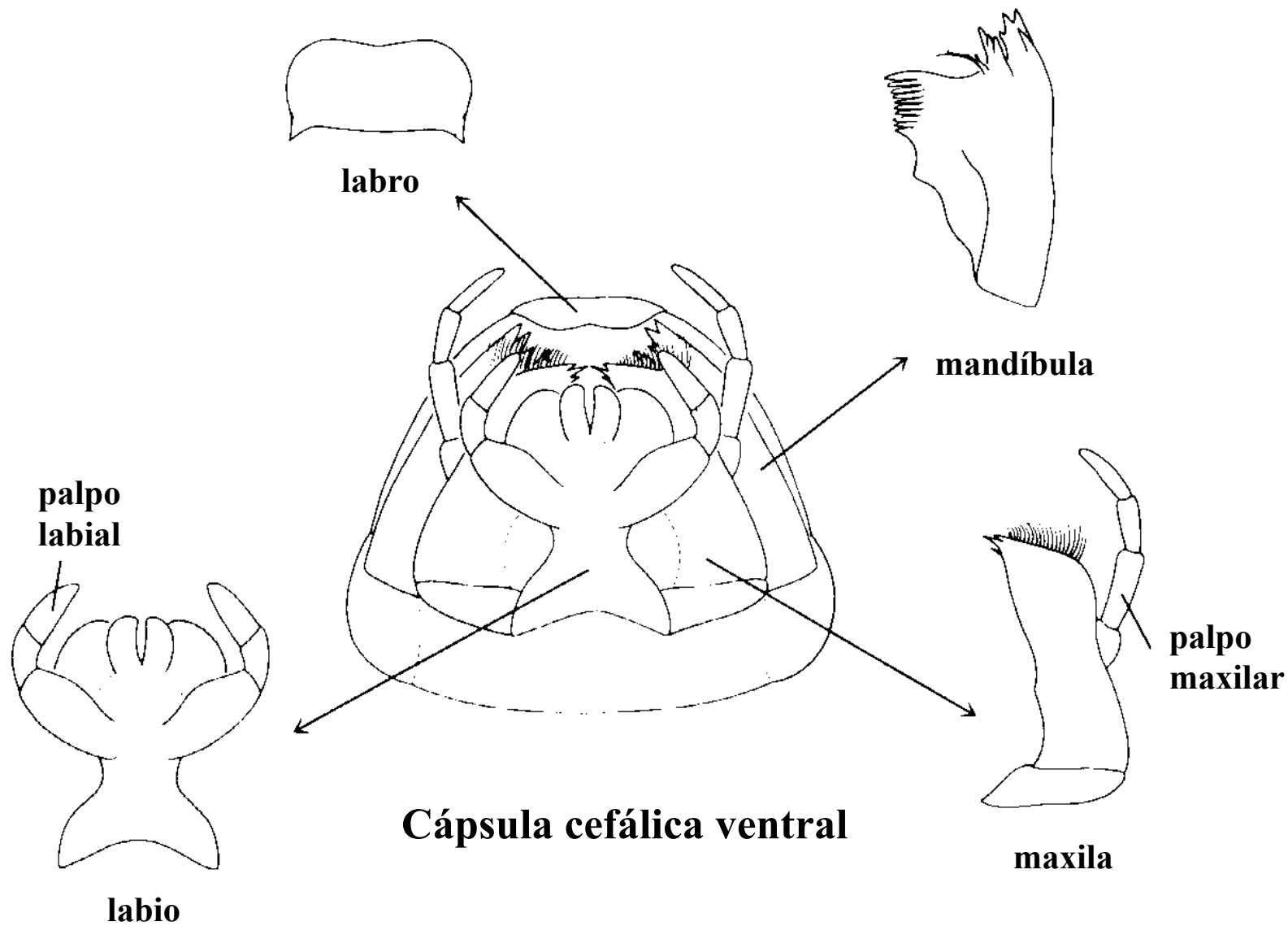
**Ana María Pujante Mora**

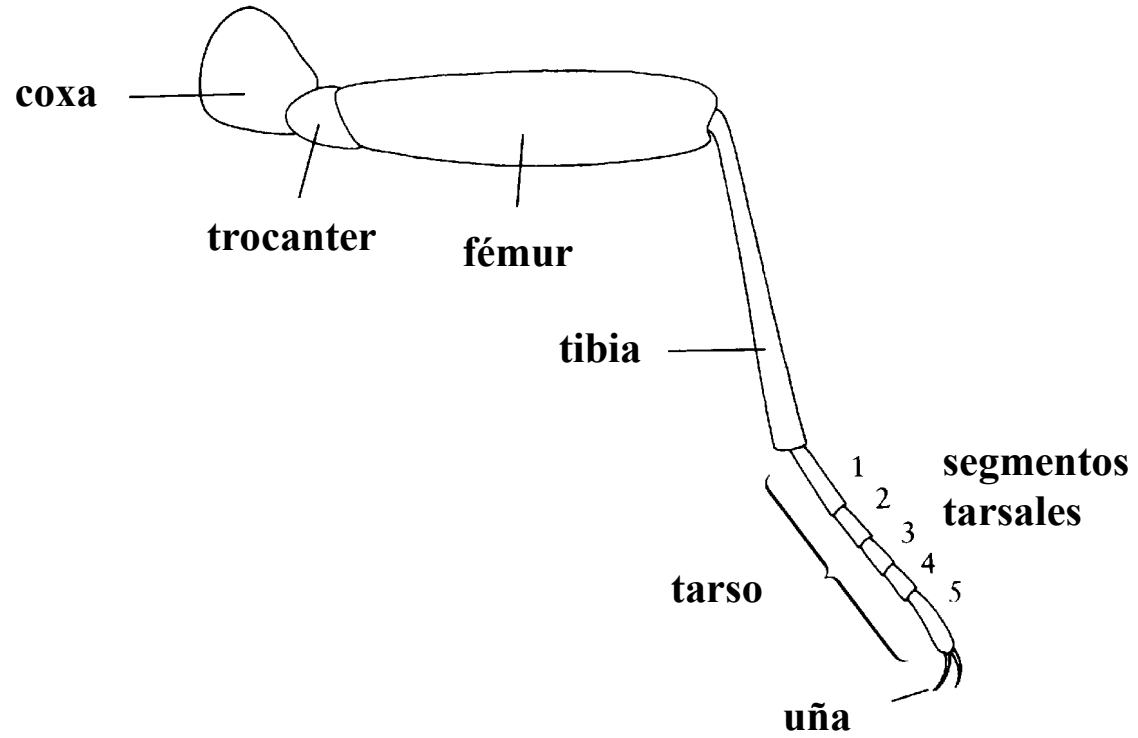
(ILLIES, 1978)

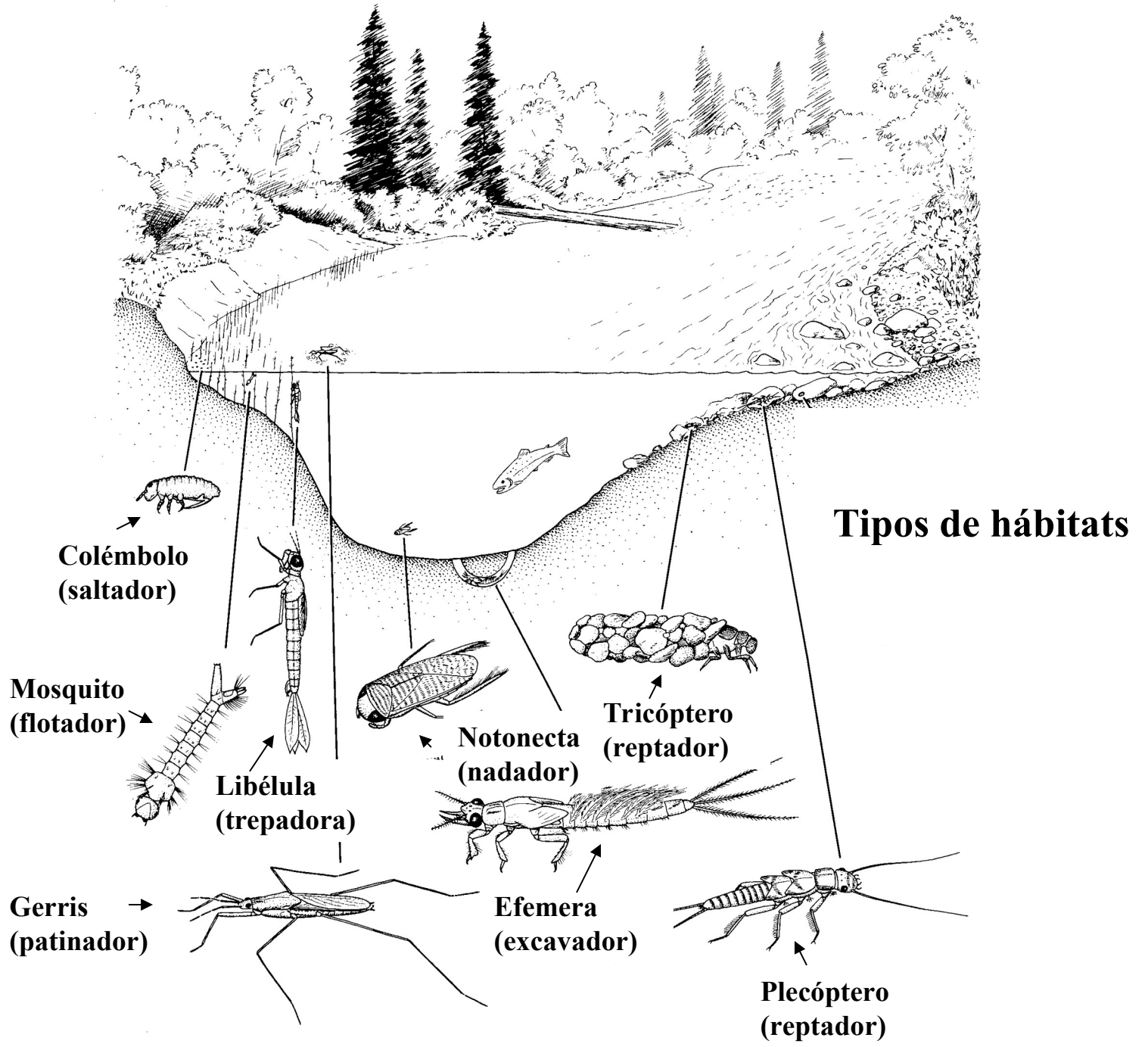


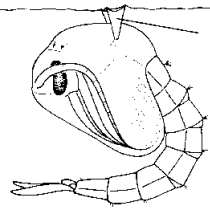






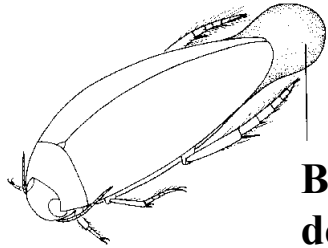






**Procesos respiratorios torácicos**

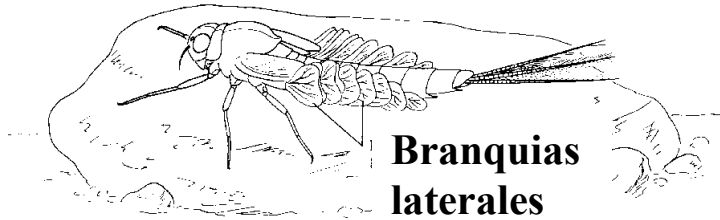
**Tubo respiratorio terminal**



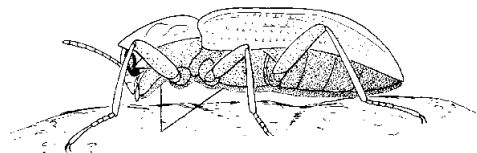
**Burbuja de aire**



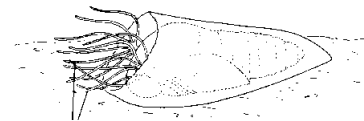
## **Tipos de respiración**



**Branquias laterales**



**Plastron ventral**



**Spiráculo branqueal**



SUBFILO	CLASE	SUBCLASE	ORDEN	Europa (*)	Ibérica (*)	Ibérica (**)
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Unirrámeos

Insectos

			Colémbolos	30		11
			Efemerópteros	217		60
			Plecópteros	387		71
			Odonatos	127		71
			Heterópteros	129		59
			Himenópteros	74		3
			Coleópteros	1072		390
			Megalópteros	16		5
			Tricópteros	895		231
			Lepidópteros	5		5
			Dípteros	4031		537
						116 (3)
						73 (4)
						79 (5)
						498 (6)
						270 (7)

(\*) Número de especies en ILLIES (1978).

(\*\*) Número de especies en diversos autores: (1) VALDECASAS (1988), (2) BALTANÁS, BEROIZ y LÓPEZ (1996), (3) SÁNCHEZ-ORTEGA y ALBA-TERCEDOR (1987), (4) CONESA (1985), (5) NIESER y MONTES (1984), (6) RIBERA (inédito), (7) GONZÁLEZ *et al.* (1992).

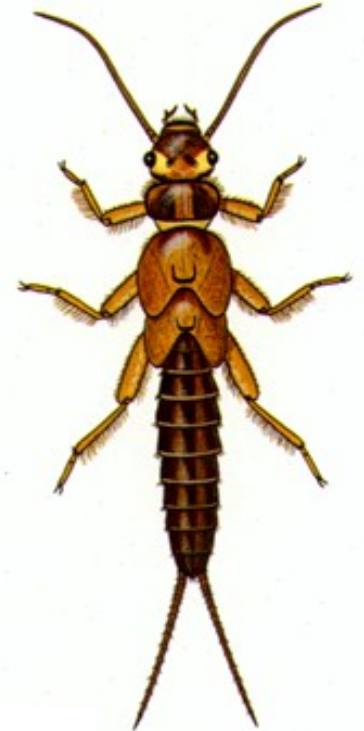
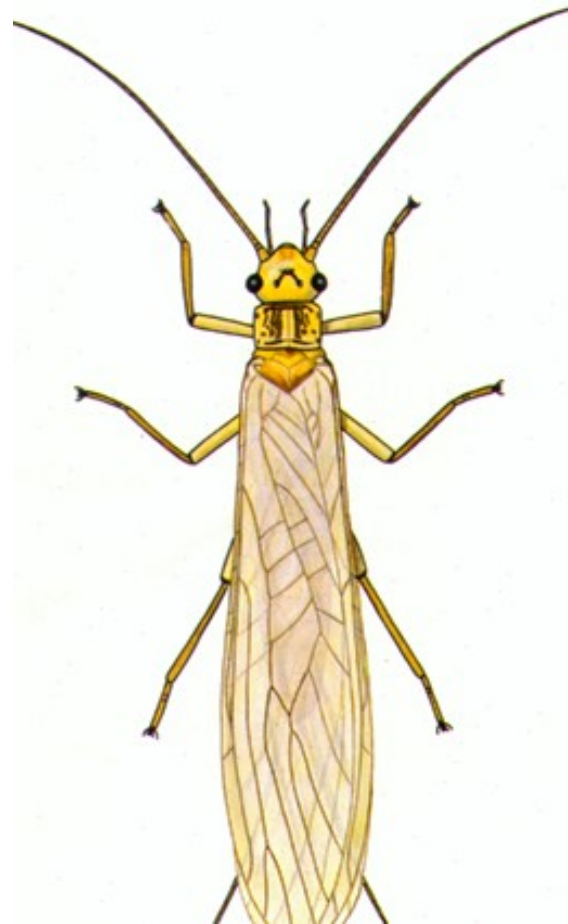
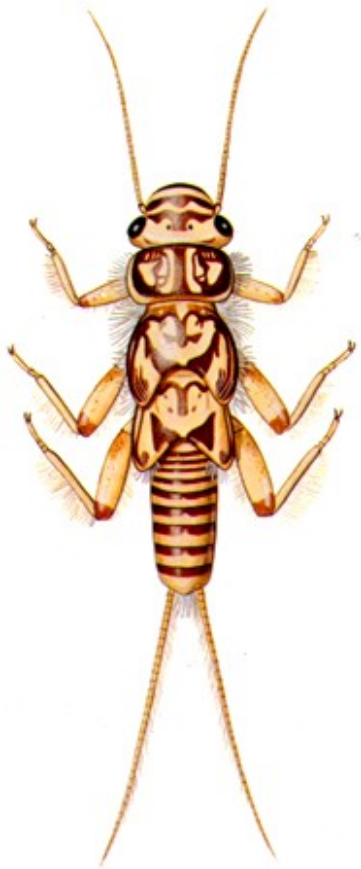
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**Efímeras o efémeras**

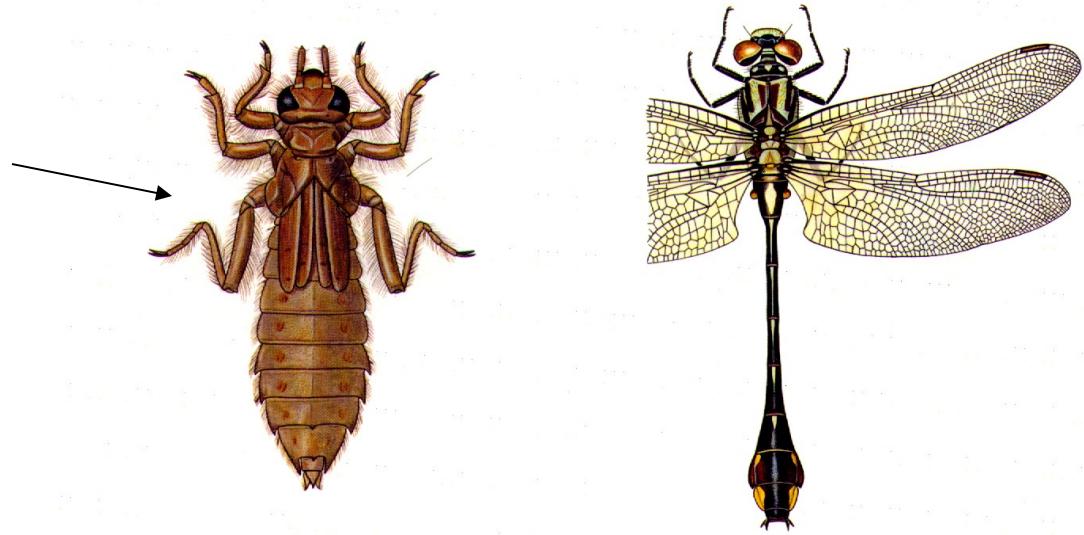


# PLECÓPTEROS



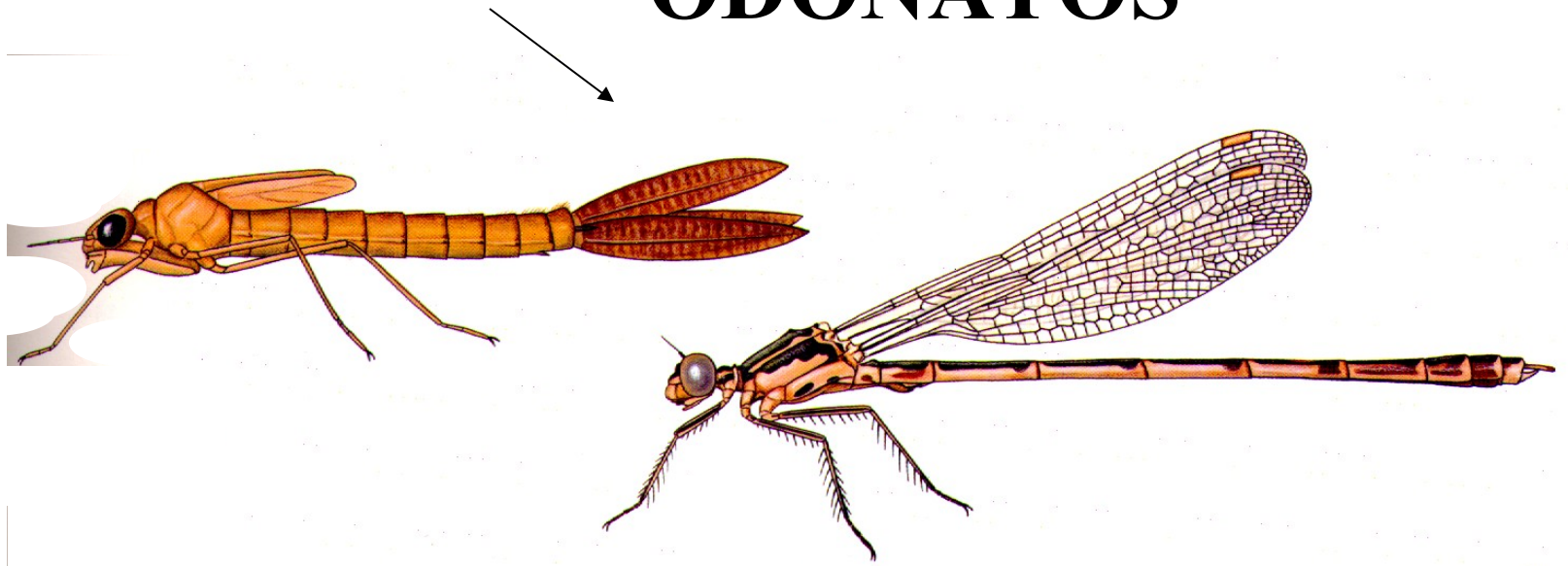
**Moscas de las piedras**

**ANISOPTEROS**  
(Libélulas)



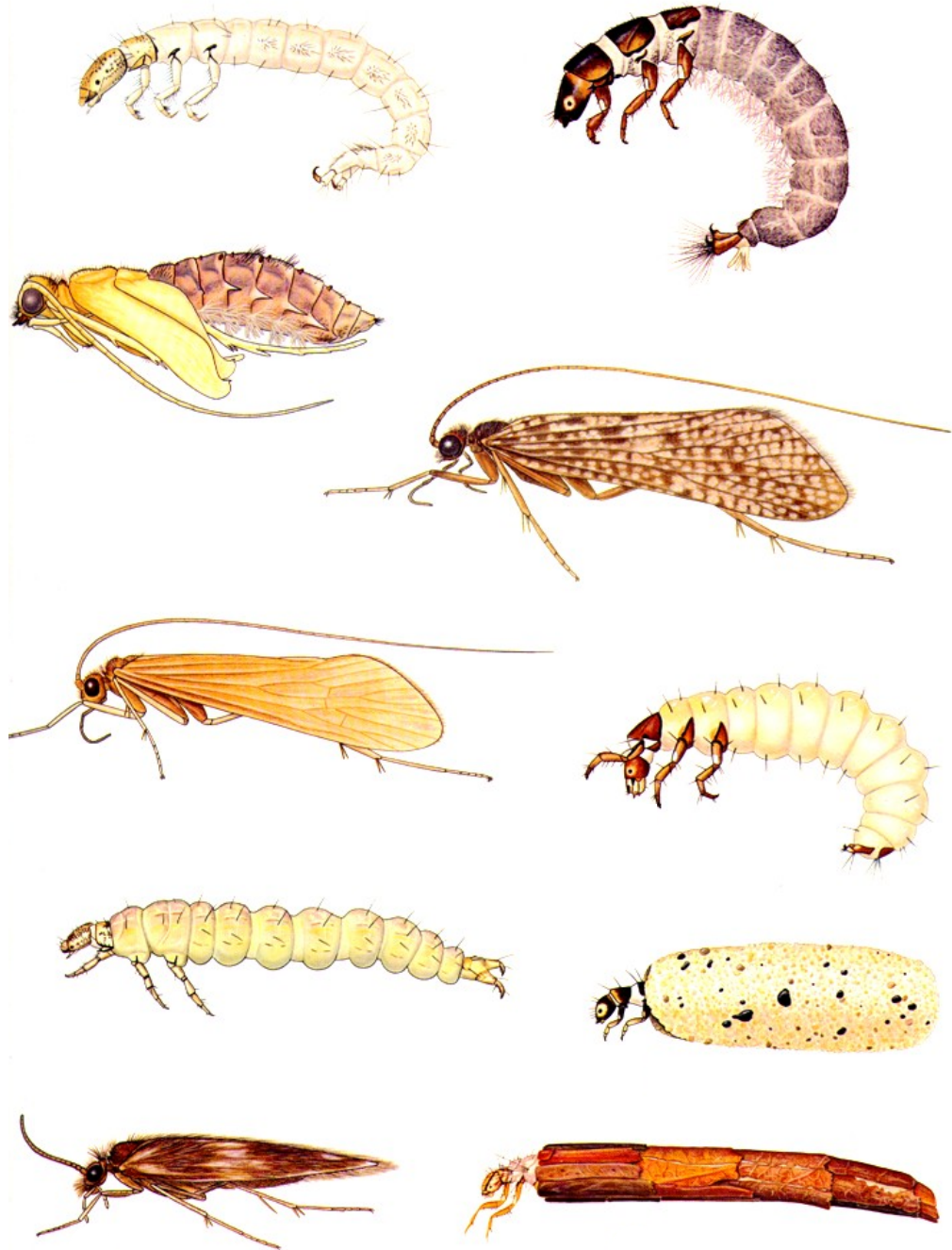
**ZYGOPTEROS**  
(Caballitos del diablo)

**ODONATOS**

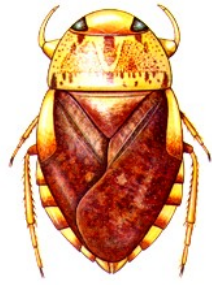
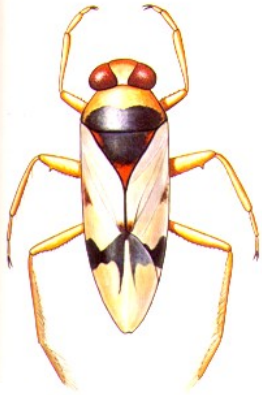


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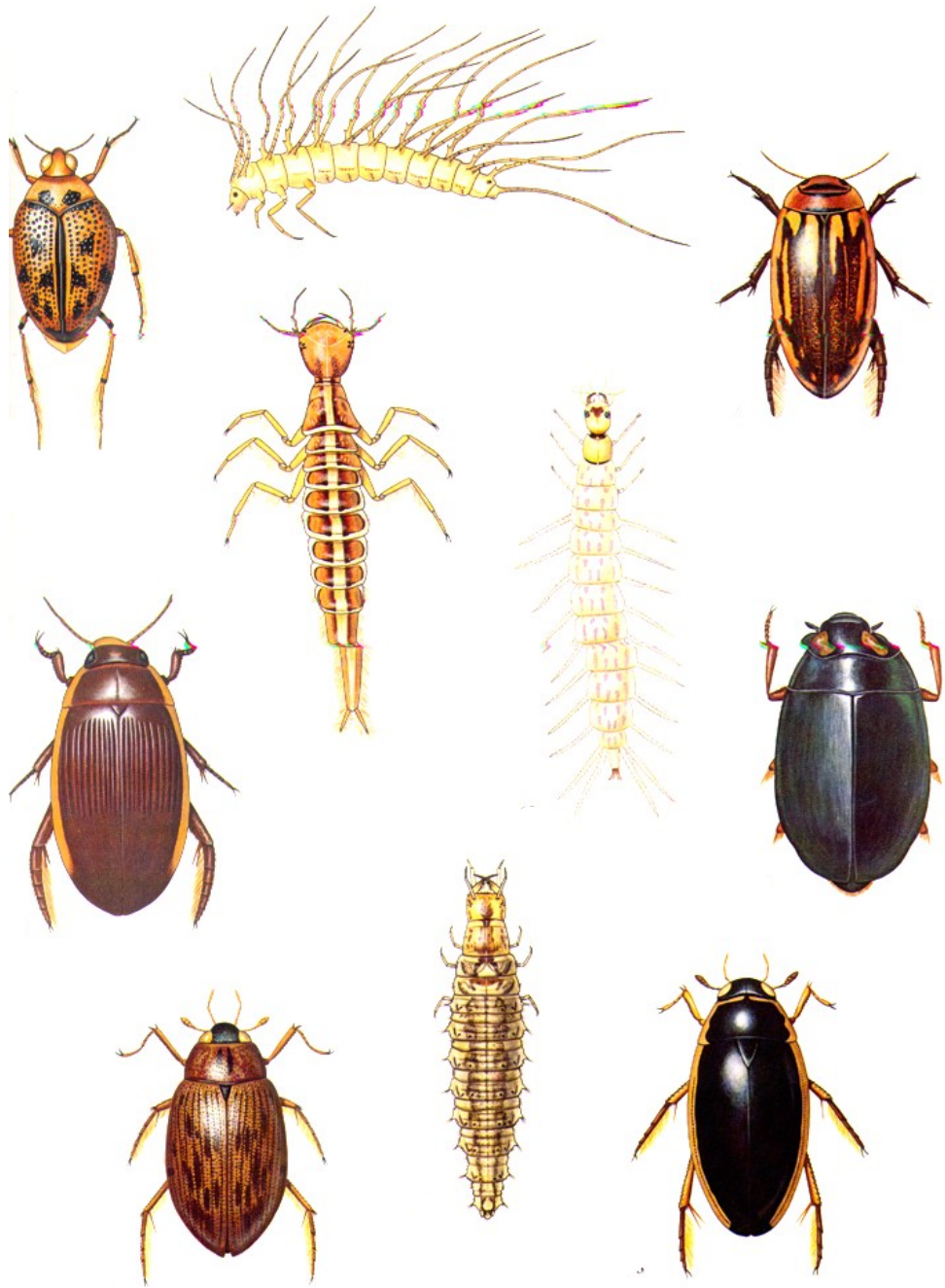
Frigáneas

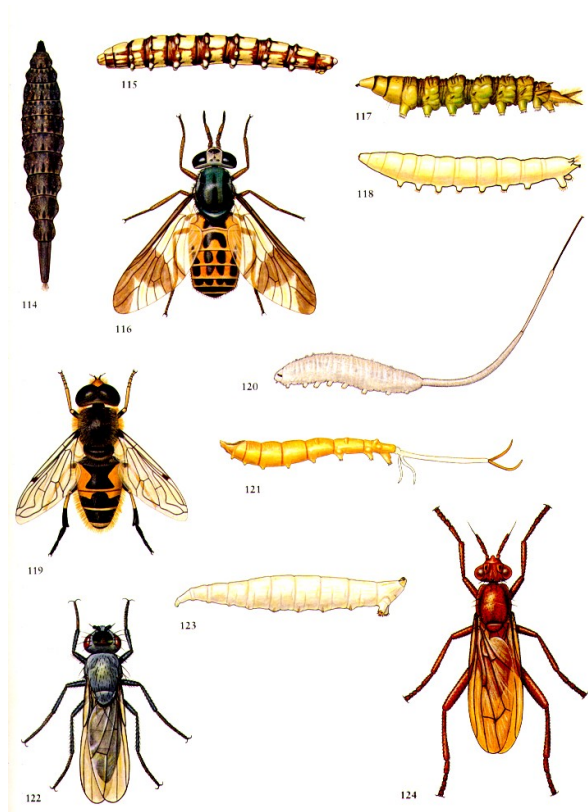
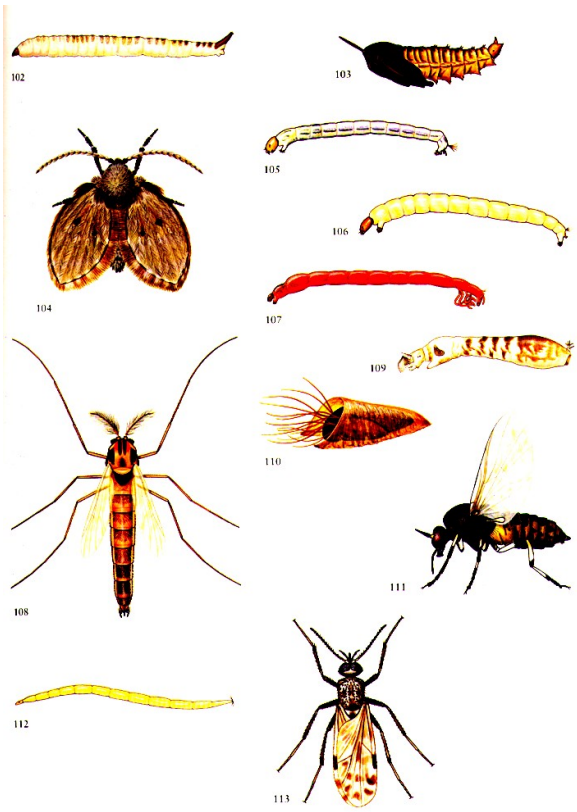
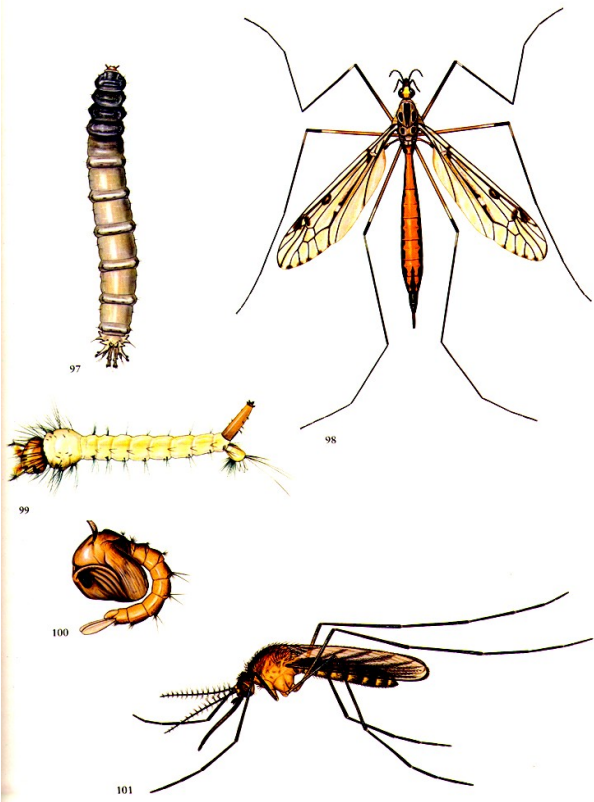


# HETEROPTEROS



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# DÍPTEROS



SUBFILO	CLASE	SUBCLASE	ORDEN	Europa (*)	P.Ibérica (*)	P.Ibérica (**)
---------	-------	----------	-------	------------	---------------	----------------

Quelicerados

Arácnidos

Ácaros

970

254

312 (1)

Crustáceos

Branquiópodos

Anostráceos

36

9

Notostráceos

4

4

Concostráceos

13

1

Cladóceros

154

47

Maxilópodos

Ostrácodos

409

38

77 (2)

Copépodos

467

88

Branquiuros

3

2

Malacostráceos

Sincáridos

41

8

Decápodos

28

7

Misidiáceos

19

Cumáceos

13

Isópodos

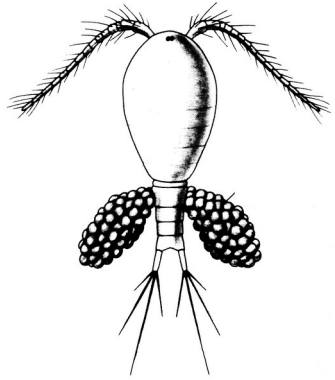
173

45

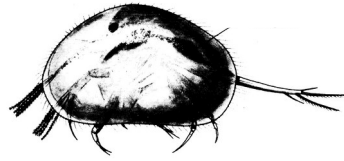
Anfípodos

356

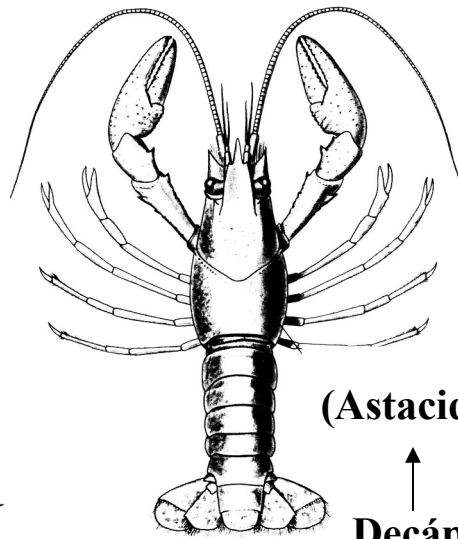
38



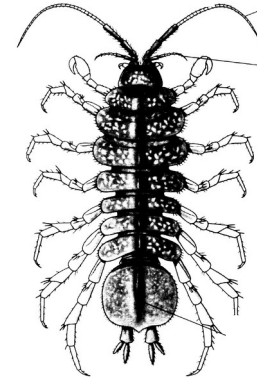
**Copéodos**



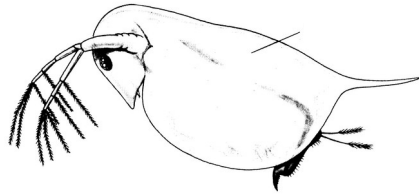
**Ostrácodos**



**(Astacidae)**



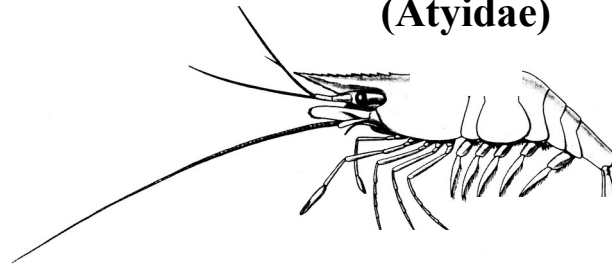
**Isópodos  
(Asellidae)**



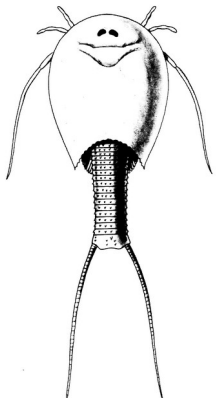
**Cladóceros  
(Daphnia)**

**Decápodos**

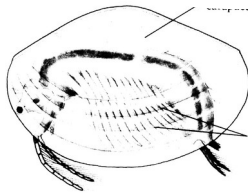
**(Atyidae)**



**Anfípodos  
(Gammaridae)**



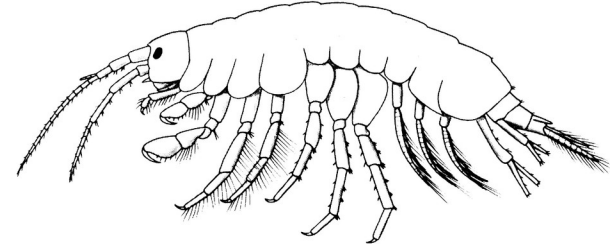
**Notostráceos  
(Triops)**

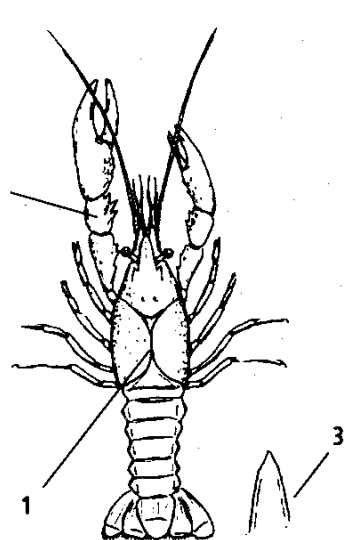


**Conchostraceos**

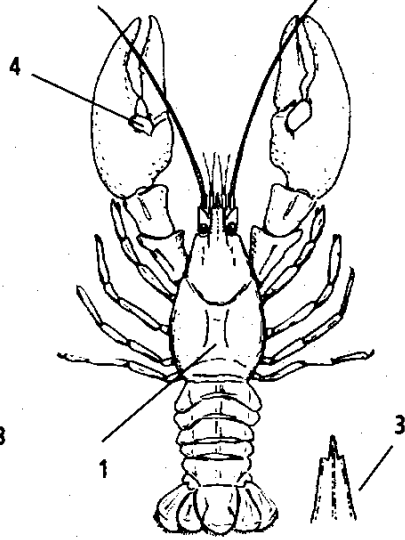


**Anacostráceos  
(Artemia)**

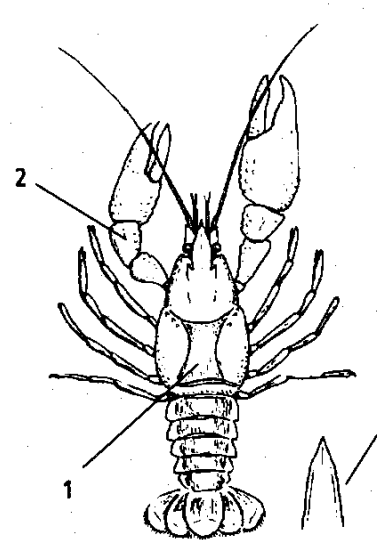




Cangrejo rojo  
(*Procambarus clarkii*)

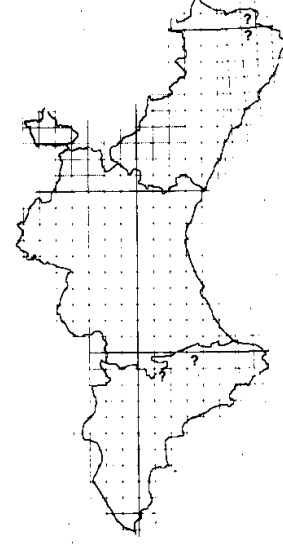
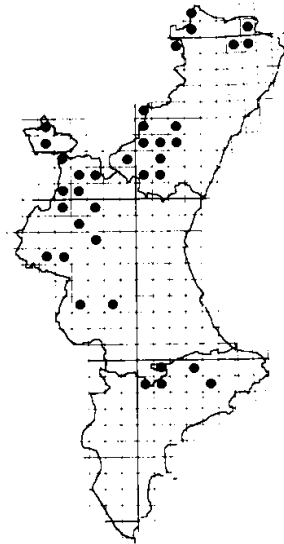
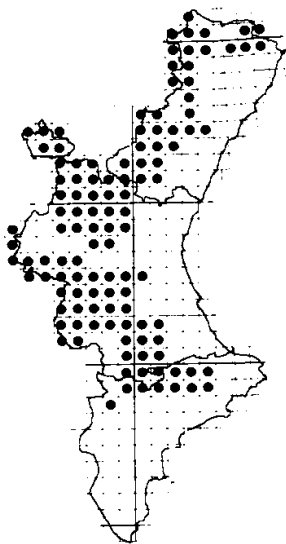


Cangrejo señal  
(*Pacifastacus leniusculus*)



Cangrejo de río autóctono  
(*Austropotamobius pallipes*)

DISTRIBUCIÓN DEL CANGREJO DE RÍO AUTÓCTONO EN LA COMUNIDAD VALENCIANA



Galindo, Monzó y Sancho  
Quercus, Julio 2000



**Atyidos**

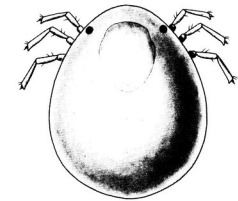
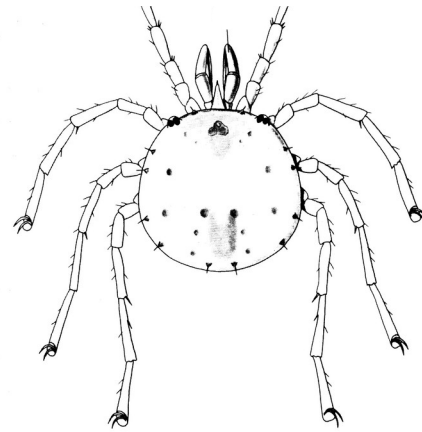
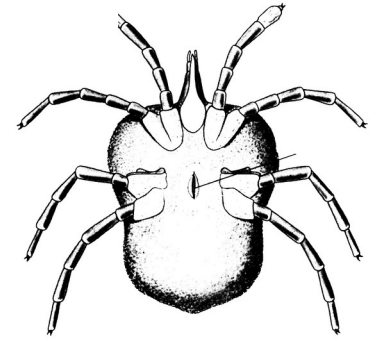
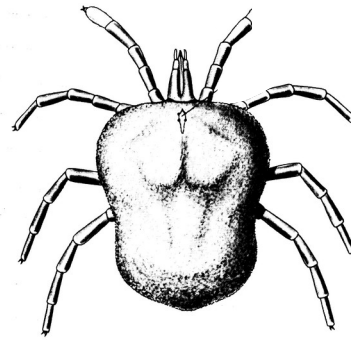


**Asellidos**



**Gammaridos**

# ÁCAROS



**TABLA 2**

**Familias de macroinvertebrados y sus puntuaciones de acuerdo con el índice BMWP' (ALBA-TERCEDOR y SÁNCHEZ-ORTEGA, 1988). Se destacan en negrilla todas las familias de artrópodos.**

Familias	Puntuación
<b>Siphonuridae, Heptageniidae, Leptophlebiidae, Potamanthidae, Ephemeridae</b> <b>Taeniopterygidae, Leuctridae, Capniidae, Perlodidae, Perlidae</b> <b>Chloroperlidae</b> <b>Aphelocheiridae</b> <b>Phryganeidae, Molannidae, Beraeidae, Odontoceridae, Leptoceridae, Goeridae</b> <b>Lepidostomatidae, Brachycentridae, Sericostomatidae</b> <b>Athericidae, Blephariceridae</b>	10
<b>Astacidae</b> <b>Lestidae, Calopterygidae, Gomphidae, Cordulegasteridae, Aeshnidae</b> <b>Corduliidae, Libellulidae</b> <b>Psychomyiidae, Philopotamidae, Glossosomatidae</b>	8
<b>Ephemerellidae</b> <b>Nemouridae</b> <b>Rhyacophilidae, Polycentropodidae, Limnephilidae</b>	7
<b>Neritidae, Viviparidae, Ancylidae</b> <b>Hydroptilidae</b> <b>Unionidae</b> <b>Corophiidae, Gammaridae</b> <b>Platycnemididae, Coenagrionidae</b>	6

<b>Oligoneuriidae</b>	
<b>Dryopidae, Elmidae, Helophoridae, Hydrochidae, Hydraenidae, Clambidae</b>	
<b>Hydropsychidae</b>	5
<b>Tipulidae, Simuliidae</b>	
Planariidae, Dendrocoelidae, Dugesidae	
<b>Baetidae, Caenidae</b>	
<b>Haliplidae, Curculionidae, Chrysomelidae</b>	
<b>Tabanidae, Stratiomyidae, Empididae, Dolichopodidae, Dixidae,</b>	
<b>Ceratopogonidae, Anthomyidae, Limoniidae, Psychodidae,</b>	4
<b>Sialidae</b>	
Piscicolidae	
<b>Hidracarina</b>	
<b>Mesoveliidae, Hydrometridae, Gerridae, Nepidae, Naucoridae, Pleidae</b>	
<b>Notonectidae, Corixidae</b>	
<b>Helodidae, Hydrophilidae, Hygrobiidae, Dytiscidae, Gyrinidae</b>	
Valvatidae, Hydrobiidae, Lymnaeidae, Physidae, Planorbidae	3
Bithyniidae, Bythinellidae, Sphaeridae	
Glossiphoniidae, Hirudidae, Erpobdellidae	
<b>Asellidae, Ostracoda</b>	
<b>Chironomidae, Culicidae, Muscidae, Ephydriidae, Thaumaleidae</b>	2
Oligochaeta	1

