

Attachment

ALMA MATER STUDIORUM
UNIVERSITA' DI BOLOGNA
SCUOLA DI SCIENZE

Corso di Laurea Magistrale in
Analisi e Gestione dell'Ambiente

Development of urease enzyme inhibitors and assessment of their efficacy and ecotoxicity

Tesi di Laurea Magistrale in
Bioraffinerie e Sostenibilità

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Sommario

Taxa present in the analysed samples	3
Mites	3
Collembola	4
Diplura	4
Diptera	5
Hapolotaxida	5
Hymenoptera	6
Psocoptera	6
Thysanoptera	6
Unidentified	7
QBS-ar calculation table	8
Bibliografia:	10

Taxa present in the analysed samples:

Mites



Figura 3 Acari.1



Figura 1 Acari.2



Figura 2 Acari.3

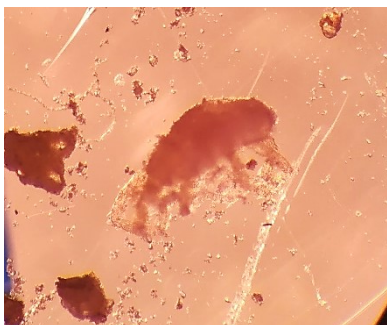


Figura 6 Acari.3



Figura 4 Acari.6



Figura 5 Acari.7



Figura 9 Acari.8



Figura 7 Acari.9



Figura 8 Acari.10

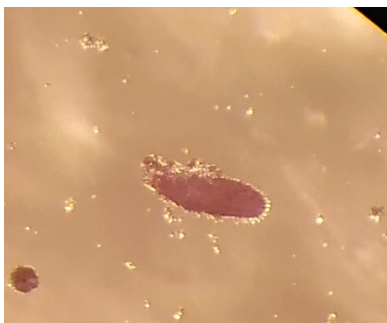


Figura 10 Acari.11

They constitute a subclass of arachnids, large and variegated. The dimensions are small (from 0.1 mm to 3 cm), the development is indirect, from the eggs comes a hexapoda larva, which will turn into an adult with four pairs of legs. The shape of the body is thick, roundish, sometimes slightly elongated. The mites are one of the main components of the soil fauna, together with Collembola.

Collembola



Figura 12
Collembola.2_Entomobryomorpha
(suborder)

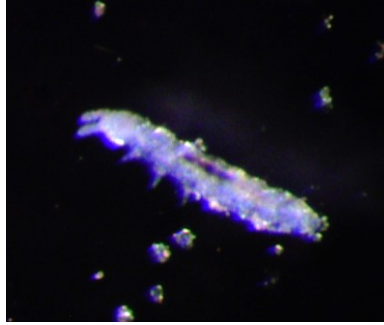


Figura 13 *Collembola.3_Poduromorpha*
(suborder)_ *Folsomia candida* sp

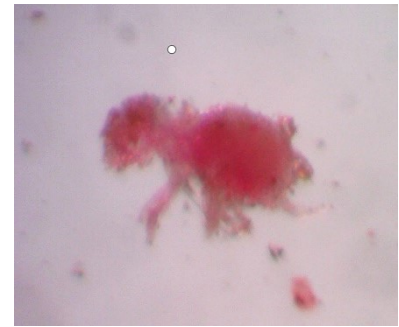


Figura 11 *Collembola.4_Neelipleona*
(suborder)

Hexapods acters, small-sized (normally less than 6 mm), widely diffused in every environment. Morphologically they are easily recognizable because of the presence of a motoring organ, the furcula, with the which animal is able to jump. Many species, particularly adapted to the edaphic life, are blind and present a strong reduction or even the disappearance of the furcula. The general appearance of the body can be lengthened with the abdominal segments well distinguished, or globular and shortened without a visible distinction of the abdominal segments.

Diplura

Hexapods of elongated and flattened shape, mostly depigmented, without eyes and with long multi-articulated antennas. On the last abdominal segment you will always find a couple of cercus, which can be joined and shaped to forceps (family Japygidae), or multiarticulate (families Campodeidae, Projapygidae). Dipluri prefer warm and temperate climates, are mostly omnivorous and feed on debris.



Figura 14 *Diplura.1_Japygidae* (family)

Diptera



Figura 20 Diptera.4



Figura 19 Diptera.5



Figura 18 Diptera.6

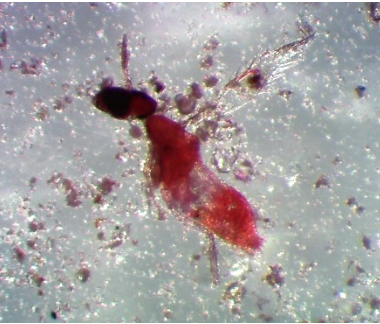


Figura 17 Diptera.7



Figura 16 Diptera.8



Figura 15 Diptera.9

Insects largely suitable for flying that carry only the first pair of wings while the second is transformed into stabilizing organs, the balancers. In the different states of their cycle they colonize all environments.

Haplotaxida

Enchytraeidae is a family of terrestrial Oligochaeta, within the Haplotaxida order. This group of small, unpigmented worms. The Enchytraeidae are thought to have arisen in cool temperate climates where they are commonly found in moist forest soils rich in organic matter.

The Enchytraeidae are typically 10–20 mm in length and are anatomically similar to the earthworms, except for the miniaturization and rearrangement of features overall.

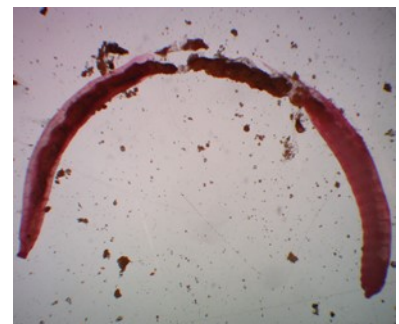


Figura 21
Haplotaxida.1_Enchytraeidae (family)

Hymenoptera



Figura 23 Hymenoptera.9



Figura 22 Hymenoptera.10

Hymenoptera possess in most cases two pairs of membranous wings. The body is generally elongated with a distinct head. The antennae are mostly long and thin, but occasionally they can also be short and thickened. The mouth apparatus can be of the lambent-sucking or chewing type. In the suborder of the apocrites chest and abdomen are joined by a pedicel. Hymenoptera live on flowers and plants, in the grass, in the ground, but also on walls.

Psocoptera

Dimensions from 1 to 8 mm. They have long and filiform antennae carried by a large head, modified chewing mouth apparatus, small prothorax, abdomen without cerci. Usually they are atheri. They are found in the soil, but also in wood, mushrooms and books. They feed on animal debris, fungi and starch.



Figura 24 Psocoptera.1

Thysanoptera

Sucking insects, generally phytophagous, small size or very small. On the head there are a pair of antennae 6 - 9 articulated. The eyes are always well developed and the mouth apparatus, shaped like a stiletto, is pungent and sucking. The wings are developed in different ways according to the species, sometimes they may be missing (even inside the same species), but their typical shape is very narrow with the margin provided with a rich fringe of hair.



Figura 25 Tisanoptera.1

Unidentified



Figura 26 Unknown.4



Figura 27 Unknown.5



Figura 28 Unknown.6

Subphylum	Group	Biological form	EMI	CONTROL 1	CONTROL 2	DES 1	DES 2	DES+POL 1	DES+POL 2	H2O+POL 1	H2O+POL 2	LIMUS 1	LIMUS 2
Atachnids	Pseudoscorpions	Youth Shapies	20										
	Scorpio		10										
	Palpigrades		20										
	Opllonids		10										
	Aranids	Shapies greater than 5 mm	1										
		Small and little pigmented shapies	5										
	Mites		20	X									
	Isopods		10										
Crustaceans	Diplopods	Forme superior a 5 mm	10										
		Forme inferior a 5 mm	20										
	Fears		20										
	Sinfilli		20										
	Chilopods	Forme superior a 5 mm, ma con zampe ben svilupate	10										
		Altre forme (Cesiflorati)	20										
Hexapods	Proturi		20										
	Dipluri		20	X									
	Collemboli	Epic forms: elongated, well-developed appendages. Visual apparatus (eye spot and eyes) well developed. Medium/large size, presence of complex livery. Epic forms not related to tree vegetation with good development of appendages, with strong development of bristles or scales. Well developed visual apparatus	1										
		Shapes of small size with medium development of appendages, well-developed visual apparatus, modest livery, shapies limited to litter.	2										
		Hemiedaphnic forms with well-developed visual apparatus, appendages not elongated, livery with colour	4										
		Hemiedaphnic forms with reduced number of oculars, poorly developed appendages, with reduced or absent furca. Presence of pigmentation	6										
		Euedaphnic forms with no pigmentation, reduction or absence of the number of eyes. Furca present but reduced	8										
		Diprimerated euedaphnic forms, without furca, stumpy appendages, presence of pseudoculi.	10		X				X				
		Developed (but not necessarily present), apomorphic sensory structures, post-antenna organ	20	X						X			

QBS-ar calculation table

Subphylum	Group	Biological form	EMI	CONTROL 1	CONTROL 2	DES 1	DES 2	DES+POL 1	DES+POL 2	H2O+POL 1	H2O+POL 2	LIMUS 1	LIMUS 2	
Insects	Microcorifi		10											
	Zigantoni		10											
	Dermatristis		1											
	Orthoptera	In general	1											
		Family-Grillidae	20											
	Embioplers		10											
	Phasmodlei		1											
	Mantoides		1											
	Mechoptera		1											
	Isoptera		10											
	Blattari		5											
	Pocoptera		1	X										
	Emiters	Epic shrapes	1											
		Cicada larvae	10											
	Rafidopteri		1											
	Tisanoptera		1										X	
	Beetles (*)	Epic shrapes	1											
		Thin leguments, with head soles	1											
		Dimensions < 2 mm	+4											
		Microaerism of Landing	+5											
	Microptahnia or anophtahnia	+5												
	In the case of eadaphobic forms	20												
	Hymenoptera	In general	1											
	Fornicides	1												
Diptera	Adults	5		X										
Rafidopteri		1												
Rafidopteri	Adults	10			X									
Mechoptera (larvae)		1												
Beetles (larvae)		10												
Diptera (larv)		10												
Hymenoptera (larvae)		10												
Lepidoptera		10												
Other holometaboles	Adults	1												
			QBS-ar	66	31	42	40	31	33	41	42	42	20	

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