

### 发头裸腹蚤雄性性别分化的诱导\*

## INDUCTION OF THE DIFFERENTIATION OF THE MALE IN *Moina irrasa*

关键词 发头裸腹蚤, 雄性, 性别分化  
Key words *Moina irrasa*, Male, Differentiation

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本文报道了重金属铜、锌、镉对发头裸腹蚤(*Moina irrasa*)雄性性别分化的诱导作用。

#### 1 材料与方 法

发头裸腹蚤(*Moina irrasa*)种取自华东师范大学生物系无脊椎动物实验室。为了保证实验蚤在遗传上的一致性,选取抱夏卵雌体1个,在食物浓度为 $2-3 \times 10^4$  yeast cell/ml,温度为20℃的条件下,对其进行单克隆培养。在种群密度达到一定程度后,取出即将产仔的雌体约250个,置于一烧杯中。翌日,收集所产幼蚤,并立即进行实验。

所用重金属盐均为AR级。每一种重金属培养液均设置有4个用蒸馏水配置的浓度水平(表1)。实验分两组,第1组为集群培养,其中的每一个浓度水平的实验条件为:培养液体积40ml,每3d更换1次,幼蚤数80个,无重复;第2组为单个培养,其中的每一个浓度水平的实验条件为:培养液体积5ml,每3d更换1次,幼蚤数1个,每一个浓度水平重复20次。两实验组的食物浓度均为 $2-3 \times 10^4$  yeast cell/ml,温度均为20℃。两组实验均设有对照,其中实验条件除无重金属外,其余分别与相应组的条件相同。6d后,计数所有培养器皿中的雄体数,及抱休眠卵的雌体数。

#### 2 结果与讨论

集群培养组中除对照外,所有的重金属浓度水平均有雄体及抱休眠卵的雌体产生(表1)。单个培养组中,无论是对照,还是各重金属浓度水平,均无雄体产生。也就是说,所有的幼蚤经6d后均发育成了雌体。

枝角类种群中雄体是如何发生的,一直是枝角类生物学中悬而未决的问题,本实验清楚地表明,发头裸腹蚤的雄性性别分化并不发生于刚排出的夏卵及胚胎发育过程中,而是发生于胚后发育时期。

在集群培养组,3种重金属在所有的浓度水平均能诱导产生雄体。显然,重金属的存在是发头裸腹蚤雄体产生的诱导因子。然而,在单个培养组,同样的实验条件未能诱导出雄体,这说明,对于发头裸腹蚤,雄体的出现还与幼蚤种群的密度相关。因此,在本实验中,重金属的存在及幼蚤种群密度两因素的共同作用,构成了诱导发头裸腹蚤雄性分化的条件。

表1 集群培养组中重金属对发头裸腹蚤雄体及抱休眠卵雌体的诱导

Tab. 1 Induction of the male and the resting egg bearing female by heavy metals in *Moina irrasa*

	对照	CuCl <sub>2</sub> (μg/L)				ZnCl <sub>2</sub> (μg/L)				CdCl <sub>2</sub> (μg/L)			
		1.0	2.5	6.5	13.5	25	50	100	200	5	10	20	40
雄体(%)	0	16	10	18	50	36	50	44	43	18	31	27	36
抱休眠卵雌体(%)	0	26	40	35	27	27	17	22	21	18	31	13	27

(下转第22页)

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dark spot at its base.

The new species is also allied to *A. punctulatus* sp. n., but distinguished from latter species by following: without large brown pattern on the body, hairs of body shorter and sparse, without brown radiate stripes on the vertex, and the different male genitalia.

Holotype ♂, Alashan League (Alashan Zuoqi), July 2, 1991, by Yang Yongqi, paratypes 2 ♂ ♂, Huhe-hote, May 21, 1981, by Yan Daping, 1 ♂, June 1, 1980, by Nonnaizab.

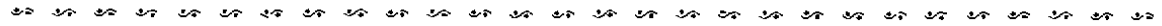
*A. Punctulatus* sp. n. (figs. 12-17)

The new species closely resembles *A. flavidus* sp. n., but with following differences: 1) the body covered with longer and dense hairs, the center of vertex with brown radiate stripes. 2) the center of corium with oval brown mark, and the posterior part of corium with irregular large brown pattern. 3) the apex of left paramere blunt, apex of vesica shape of theca and right paramere different.

The new species is also similar to *A. flavescens* Putshkov, but differs in that center and posterior part of corium with large brown pattern and male genitalia different.

Holotype ♂, Alashan League (Alashan Zuoqi), July 23, 1991, by Yang Yongqi, paratypes 7 ♂ ♂, same as holotype.

**Key words** Miridae, New species, New records, Inner Mongolia



(上接第 16 页)

雄性性别的天分化是否在枝角类中,乃至所有有孤雌生殖习性的动物类群中普遍存在,性别分化发生于何期幼龄及分化的内在机制等,值得进一步探讨。

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