



Quantitative characterization of pederin in the rove beetle, Staphilinidae; *Paederus*, in Mazandaran and Fars provinces, Iran.

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Introduction

Rove beetles, genus *Paederus* have a vesicant toxin amid, in their hemolymph, named pederin, caused lesions on human skin. It was first described by a procedure on 25million *P.fuscipes* collected from field. A few studies were conducted about pederin content of each beetle. It is very various in each specimen.

Methods

Kellner and Dettner assessed a new method for quantification of pederin in each beetle for the first time. Before that, severity of dermatitis caused by *Paederus* beetles was the only method for determination of pederin content. They also reported 0.1-1.5 µg of the toxins in males and 0.2-20.5 µg in females, 10 fold more than males in most cases.

Results

In Mazandaran province with only one *Paederus* species (*P.fuscipes*) pederin content of specimens was 0.76 µg in males and 10.89 µg in females. *P.fuscipes* and *P.littoralis* from Fars province had 10.31 and 3.29 µg pederin in females and 0.73 and 0.36 µg in males respectively. Weight ratio for samples was calculated according to the average weight of each beetle (3mg) and its pederin content. In both species, males and females have very difference in maximum amount of determined pederin. Pederin content in females were significantly more than males in both region (Mazandaran province: Two-Sample T-Test, P-Value= 0.0001, DF= 32, Fars province: Two-Sample T-Test, P-Value = 0.002, DF = 23). Females of each species in Fars have significantly pederin more than males (Two-Sample T-Test, *P. fuscipes*: P-Value = 0.0001, DF = 6; Two-Sample T-Test, *P. littoralis*: P-Value = 0.0001, DF = 16). Specimens of Mazandaran (northern Iran) have pederin more than Fars (southern Iran) significantly, regardless species or sexes (Two-Sample T-Test, P-Value= 0.000, DF= 100).

Pederin content of *Paederus fuscipes* in Mazandaran province

| <i>P. fuscipes</i> | | |
|--------------------|----|--------------|
| Sex | N | µg ± SE |
| Male | 30 | 0.76 ± 0.19 |
| Female | 30 | 10.89 ± 0.77 |

Pederin content of *Paederus fuscipes* in Fars province

| <i>P. fuscipes</i> | | |
|--------------------|---|--------------|
| Sex | N | µg ± SE |
| Male | 9 | 0.73 ± 0.18 |
| Female | 7 | 10.31 ± 0.95 |

Pederin content of *Paederus littoralis* in Fars province

| <i>P. littoralis</i> | | |
|----------------------|----|--------------|
| Sex | N | µg ± SE |
| Male | 24 | 0.36 ± 0.087 |
| Female | 17 | 3.29 ± 0.499 |

Pederin weight ratio in *P. fuscipes*, Mazandaran province

| Weight Ratio | <i>P. fuscipes</i> |
|--------------|-------------------------|
| Male | 2.53 × 10 ⁻⁴ |
| Female | 36.3 × 10 ⁻⁴ |

Pederin weight ratio in *P. fuscipes* and *P. littoralis*, Fars province

| Weight Ratio | <i>P. fuscipes</i> | <i>P. littoralis</i> |
|--------------|--------------------------|--------------------------|
| Male | 2.43 × 10 ⁻⁴ | 1.2 × 10 ⁻⁴ |
| Female | 34.36 × 10 ⁻⁴ | 10.97 × 10 ⁻⁴ |

Conclusions

In this study pederin is quantified in field specimens of two province of Iran, Fars (south of Iran) and Mazandaran (north of Iran). Males contain 0.76µg, 0.73µg and 0.36µg for *P. Fuscipes* Mazandaran, *P. Fuscipes* Fars and *P. littoralis* Fars and females 10.89 µg, 10.31 µg and 3.29 µg of the toxin respectively.

References

Kellner LLR, Dettner K. *Paederus* rove beetles (Coleoptera: Staphylinidae): evidence for polymorphism of hemolymph toxin. J Chem Ecol 1995; 21 (11): 1719-1733.



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