Dancing with dorids: Phylogenetic systematics of discodorid nudibranchs in the genus *Rostanga*

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Nudibranchs
Discodorid biology

- Gill plume around anus
- A pair of finger-like oral tentacles
Rostanga Bergh 1879

- Red-orange to orange coloration
- Feed on sponges
- Possess caryophyllidia
Research Questions

1) How are species within the genus *Rostanga* related?

2) How do morphological characteristics vary based on evolutionary relationships?

3) How effective are these characteristics at predicting the placement of taxa in the phylogeny?
Methods

Morphology
- Scanning Electron Microscope
  - Radula
  - Caryophyllidia
- Dissecting Microscope
  - Reproductive system
Rostanga sp. 1

Rostanga sp. 2

Rostanga sp. 3
Radulae under SEM

*Rostanga lutenscens*

*Rostanga sp.*
Radulae under SEM

*Rostanga lutenscens*

*Thordisa sp.*
Radulae under SEM

Rostanga lutenscens

Rostanga sp.
Radulae under SEM

*Rostanga lutenscens*

*Jorunna sp.*
Methods

Molecular
- Genes COI, 16S, H3
  - Sanger Sequencing
- RAxML
- MrBayes
Rostanga sp. 1
Rostanga sp. 1
Rostanga sp. 2
Rostanga sp. 3
Rostanga elandsia
Rostanga elandsia
Rostanga sp.
Rostanga sp. pink
Rostanga ghiselini
Rostanga byga
Rostanga pulchra
Rostanga pulchra
Atagemanota cristata
Rostanga muscula
Rostanga calumus
Rostanga sp. (orange)
Rostanga sp. (orange)
Rostanga sp. Z orange
Rostanga sp.
Rostanga sp. (red)
Rostanga sp. (red)
Platydoris argo
Rostanga sp. (white)
Gargamella gravistella
Diaulula sandiegensis
Peltodoris nobilis
Rostanga sp. yellow
Taringa telopia
Rostanga lutenscens
Rostanga sp. red
Rostanga lutenscens red
Rostanga sp.
Rostanga sp.
Rostanga phepha
Rostanga sp. Z orange
Rostanga sp. white
Rostanga sp. white
Rostanga sp.
Jorunna tomentosa
Jorunna funebris
Discodoris cebuensis
RAxML
RAxML

3 new species
RAxML

3 new species

Thordisa sp.
3 new species

Thordisa sp.

Lutescens clade
3 new species

Thordisa sp.

Lutescens clade

Jorunna
3 new species

Thordisa sp.

“True” Rostanga

Lutescens clade

Jorunna
RAxML

“True” Rostanga

3 new species

Thordisa sp.

Lutescens clade

Jorunna
3 new species

“True” Rostanga

Thordisa sp.

Jorunna

Lutescens clade

?
Conclusions

1) There is some support for a grouping of “true” *Rostanga* that possess elongate outer teeth with divided tips.

2) The morphological and molecular data seem to support each other in determining new species and relationships.
Future directions

1) Look more into reproductive systems and compare those to the phylogeny.
2) Resolve issues with CO1.
3) Increase taxon sampling across the genus especially for taxa that have never been sequenced.
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