

Analysis in pre and post eruptive periods of zooplankton from La Restinga (SW-El Hierro, Canary Islands). VULCANO project (CTM2012-36317)

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Fig. 1. *Pterosagitta draco* in maturity stage III.

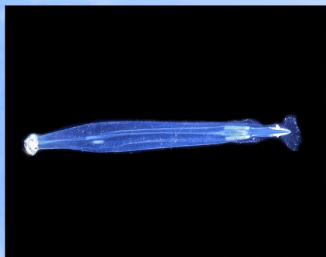


Fig. 2. *Sagitta inflata* in maturity stage III.



Fig. 3. Adult specimen of the heteropod *Atlanta peroni*.



Fig. 4. *Cresseis virgula*, an abundant pteropod present in almost all samples analyzed.

The "Museo de Ciencias Naturales de Tenerife" carried out some studies at La Restinga (SW of El Hierro Island), previous to the submarine volcanic eruption in October 2011 (Hernández, 1985; Hernández & Jiménez, 1992 and Hernández & de Vera, 2011). Zooplanktonic data groups were obtained, especially chaetognaths collected in the area where the source of material from magmatic emission was subsequently placed. These studies revealed the richness of zooplanktonic zone. Hernández recorded in his work (Hernández, 1985) as dominant species, *Sagitta serratodentata* and *Sagitta minima* present in the current study with high values of abundance, especially the second one. Later, Hernández & Jiménez (1992) relate *Sagitta decipiens*, *Sagitta inflata* and *Sagitta lyra* as predominant in the samples, although with very similar percentages. *Sagitta minima*, prominent species in the samples of percentage of presence in the campaign of the VULCANO project (March, 2013), is founded in every state of sexual maturity (I, II and III in the latter case in stations closer to the coast). Therefore, it is confirmed that it is a species well represented, not only in El Hierro (West area). In the present study 1,855 mature individuals (stages of maturity I, II and III) and 702 juvenile chaetognaths were analyzed. Eleven species have been identified, belonging to the genera *Sagitta*, *Krohnhitta* and *Pterosagitta*, nine of the genus *Sagitta*: *Pterosagitta draco* (Fig. 1), *Krohnhitta pacifica*, *Krohnhitta subtilis*, *Sagitta sibogae*, *Sagitta decipiens*, *Sagitta planctonis*, *Sagitta hexaptera*, *Sagitta inflata* (Fig. 2), *Sagitta serratodentata*, *Sagitta lyra* and *Sagitta minima*. The most abundant species was *Sagitta minima*, followed by *Sagitta inflata* and *Sagitta serratodentata*. *Sagitta decipiens* and *Sagitta sibogae*, which are not very frequent in Canary Islands coastal plankton, are present on the island of El Hierro, where are relatively abundant in the species list of previous work of the authors (pre-eruptive) and in recent samplings post-eruptive. The mollusc *Atlanta meteoris* is present at several stations located at different sides of the island, having recently recorded for the first time to the Atlantic Ocean (De Vera et al., 2006). Some common epipelagic species typical from undisturbed communities of this surface layer (*Cresseis clevea*, *C. virgula* (Fig. 4)) were abundantly collected. There is also a high abundance of benthic molluscs protoconchs at stations near the coast and in normally distributed values along sub-grid samples surrounding the volcano. The presence of these veliger larvae suggests that there is a recolonization of benthic gastropods in the vicinity of the eruption. Although the analysis of the rest of VULCANO cruises is not finished, we can affirm preliminarily that there are no differences in the abundance and distribution of mesozooplanktonic species in the area, if they are compared with studies previous to the eruption. In parallel, some species of great interest due to its low abundance have been collected, including the crustacean *Ampelionides reynaudii* and the nudibranch *Cephalopogyre trematoides*.

| SPECIES | St3 | St4 | St5 | St31 | St33 | St34 | St20 | St21 | St22 |
|-------------------------------|-----|-----|-----|------|------|------|------|------|------|
| <i>Sagitta minima</i> | 65 | 63 | 71 | 76 | 61 | 32 | 41 | 55 | 48 |
| <i>Sagitta lyra</i> | 22 | 9 | 4 | 14 | 13 | 5 | 3 | 3 | 5 |
| <i>Sagitta inflata</i> | 7 | 5 | 4 | 2 | 2 | | 15 | 8 | 19 |
| <i>Sagitta serratodentata</i> | 7 | 22 | 4 | 14 | 23 | 12 | 2 | 3 | 1 |
| <i>Pterosagitta draco</i> | 3 | 3 | 5 | 6 | | 11 | 2 | 3 | |
| <i>Sagitta hexaptera</i> | | | | 2 | 1 | 2 | 6 | 3 | 4 |
| <i>Sagitta decipiens</i> | | | 1 | 7 | 2 | | | 1 | 1 |
| <i>Sagitta sibogae</i> | | | | | | | | | |
| <i>Krohnhitta subtilis</i> | 3 | 1 | 2 | 2 | 1 | | | 3 | 3 |
| <i>Krohnhitta pacifica</i> | 2 | 1 | 1 | 3 | 16 | 4 | 4 | 4 | 3 |
| <i>Sagitta planctonis</i> | 1 | | 2 | | | 1 | | | |

Table II. List of chaetognath species and specimens per sampling station. Stations 3,4 and 5: East El Hierro; 31, 32 and 33: Northwest of El Hierro; 20, 21 and 22 West of El Hierro.

| STATION | CHAETOGNATHS | MOLLUSCS | MEDUSAE |
|---------|--------------|----------|---------|
| 3 | 110 | 12 | 14 |
| 4 | 100 | 14 | 39 |
| 5 | 90 | 13 | 18 |
| 20 | 84 | 5 | 30 |
| 21 | 82 | 5 | 31 |
| 22 | 86 | 14 | 21 |
| 31 | 124 | 26 | 25 |
| 33 | 112 | 53 | 15 |
| 34 | 67 | 2 | 13 |
| 13 | 107 | 12 | 37 |
| 50 | 70 | 11 | 35 |
| 51 | 60 | 14 | 50 |
| 52 | 113 | 28 | 24 |
| 53 | 100 | 9 | 41 |
| 54 | 74 | 16 | 14 |
| 55 | 43 | 6 | 39 |
| 56 | 45 | 7 | 28 |
| 56(2) | 99 | 9 | 111 |
| 57 | 94 | 12 | 24 |
| 58 | 71 | 17 | 9 |
| 59 | 66 | 11 | 17 |
| 61 | 83 | 29 | 39 |

Table I. Number of identified specimens of each of the groups studied during the first cruise of VULCANO Project.

| SPECIES | St3 | St4 | St5 | St31 | St33 | St34 | St20 | St21 | St22 |
|------------------------------|-----|-----|-----|------|------|------|------|------|------|
| <i>Atlanta peroni</i> | | | | 2 | 2 | | | | |
| <i>Atlanta heliconioidea</i> | | | | | | | | | |
| <i>Atlanta meteoris</i> | | 1 | | | | | | | |
| <i>Atlanta meteoris</i> | | 1 | | 1 | 1 | | | | |
| <i>Atlanta ganduchandi</i> | | 1 | | | | | | | |
| <i>Atlanta tokohani</i> | | 1 | | | | | | | |
| Larvae Atlanta | | | 3 | | | | | | |
| <i>Limacina inflata</i> | | | 6 | 8 | 8 | | | 3 | 3 |
| <i>Limacina bahamoides</i> | 1 | 1 | 4 | 9 | 1 | 9 | 1 | 1 | 1 |
| <i>Limacina heliconides</i> | | 2 | | | | | | | |
| <i>Limacina lewyczeri</i> | | 1 | | | | | | | |
| Larvae Cavolinidae | 3 | 1 | | | 7 | 1 | 7 | 1 | 1 |
| <i>Cresseis clevea</i> | 1 | 1 | 1 | | | | | | |
| <i>Cresseis virgula</i> | 2 | 7 | 2 | 3 | 6 | 6 | 4 | 1 | 1 |
| <i>Anomopoma papilio</i> | 1 | 1 | | | | | | | |
| <i>Dicera quadridentata</i> | | | | | | | | 1 | 1 |
| <i>Peratthis diversa</i> | | | | | | | | | |
| <i>Stylodina stylodina</i> | 1 | 2 | 1 | 5 | 5 | | | | 2 |
| <i>Prostatina soubeyti</i> | 1 | 1 | 4 | 4 | 4 | | | | |
| <i>Cavolinia</i> sp. | | | | | | | | | 1 |
| Protoconchs de heteropod | 4 | 2 | 8 | 11 | 11 | | | | |

Table III. List of species and specimens of molluscs from sampling station. Stations 3,4 and 5: East El Hierro; 31, 32 and 33: Northwest of El Hierro; 20, 21 and 22 West of El Hierro.

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