POPULATION DENSITY AND HOME RANGE OF THE COMMON CHAMELEON *CHAMAELEO CHAMAELEON* AND THE AFRICAN CHAMELEON *CHAMAELEO AFRICANUS* FROM GREECE

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C.chamaeleon from Samos (photo M. Dimaki)

METHODOLOGY

➢Field work was done during the period 1998-2003 and took place in Samos island, where the Common Chameleon is found and in Gialova, Pylos, the only place in Europe where the African Chameleon is found. The two species are not sympatric in Greece.
➢We used both capture-marking-recapture method and the transect method to estimate the population size of the species. We used the Schnabel and Petersen indexes of population estimation. The animals were marked using a waterproof ink. Distances covered were recorded with a pedometer.
➢Eleven adult chameleons (seven from Pylos, all males, and four from Samos, 2 females and 2 males) were attached with mini radio transmitters (BD-2G) with a life span of 16 weeks. The transmitter is glued on the body, weighed 1.7 g (less than 10% of the body weight of the animals) and includes a 15 cm whip antenna. With a TR4-Telonics receiver and an antenna, the chameleon with the transmitter can be located on a distance of at least 500 meters.
➢Home range was estimated using the convex polygon method.

Population density of *C.chamaeleon* in Samos

Date	Sampling area (ha)	Pop. estimation	densiy/ ha
June 1998	0.075	4	**53.33**
July 1999	0.95	3	**3.16**
July 1999	1.2	3	**2.50**
July 1999	1.96	5	**2.55**
July 1999	0.95	1	**1.05**
May 2000	1.2	2	**1.67**
May 2000	0.95	2	**2.11**
July 2000	1.96	5	**2.55**
July 2000	1.96	2	**1.02**
July 2000	1.2	1	**0.83**
July 2000	1.96	2	**1.02**
July 2000	1.2	1	**0.83**
July 2000	1.96	3	**1.53**
August 2000	1.96	4	**2.04**
August 2000	1.2	2	**1.67**
August 2000	0.95	5	**5.26**
August 2000	0.95	2	**2.11**
Sept. 2000	0.95	6	**6.32**
Sept. 2000	1.96	2	**1.02**
Sept. 2001	0.95	4	**4.21**
Sept. 2001	1.96	6	**3.06**
Sept. 2001	1.2	1	**0.83**
Mean			**4.58**

RESULTS & DISCUSSION

➢A total of **947 individuals of *C. africanus*** were captured, of which 256 were recaptures. 404 were females, 324 males and in 219 sex determination was not possible.
➢A total of **67 individuals of *C. chameleon*** were captured. From them only 3 were recaptures. We totally caught 16 females, 20 males and in 31 sex determination was not possible. **55.4% were adults** and **44.6% juveniles**.
➢No statistically significant difference was found at the sex ratio of both species (Mann-Whitney U test). This was expected for most lizard species (Burrage, 1973).
➢A significant difference was found in the age ratio only for *C. africanus* (Mann-Whitney U test). The **39.3% were adults** and **60.7% were juveniles** (SVL<114 mm). In Pylos, juveniles were more than adults, with the exception of August 1997, 1998, and 2003. Such a difference has not been observed in Samos. This might indicates that *C. africanus* had larger reproductive success.

Population density of *C. africanus* in Pylos

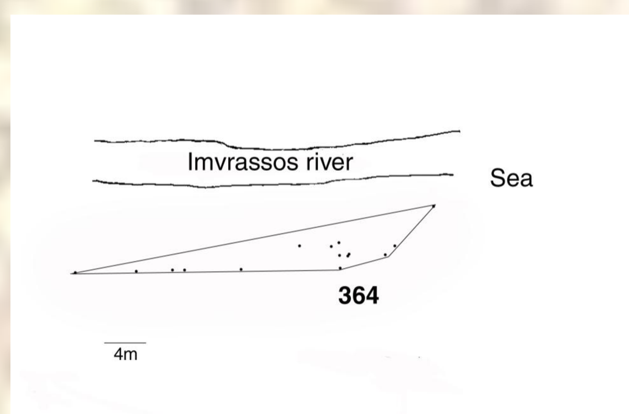
Date	Sampling area (ha)	Pop.estimation	density /ha
April 1998	7	58,95	**8.42**
April 1998	5.5	77	**14.00**
May 1998	7	93.6	**13.37**
May 1998	4	24	**6.00**
May 1998	4.5	33	**7.33**
June 1999	7	117.35	**16.76**
July 1999	0.2	80.26	**401.30**
May 2000	7	79.14	**11.31**
April 2001	5.5	17	**3.09**
April 2001	7	159.82	**22.83**
June 2003	7	63.06	**9.00**
August 2003	7	48.31	**6.90**
Mean			**43.36**
Mean	without	401.30	**10.82**

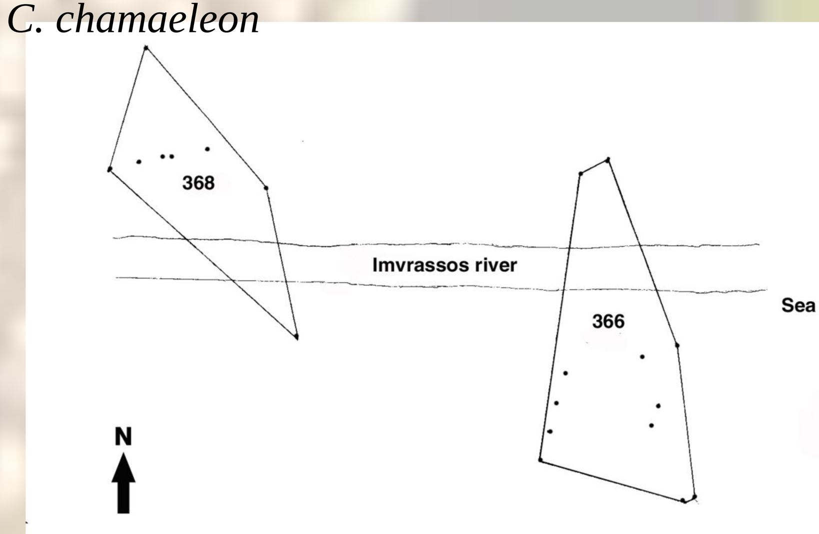
The population density of *C. africanus* was much larger than *C. chameleon*, probably because of the optimum habitat in Pylos that is a wetland with great food availability. The larger relative humidity favours the incubation of the eggs which means larger reproductive success (Martin, 1992). Also in Pylos the soil is more sandy, while in Samos the soil is more rocky (Rhizos, 1998).

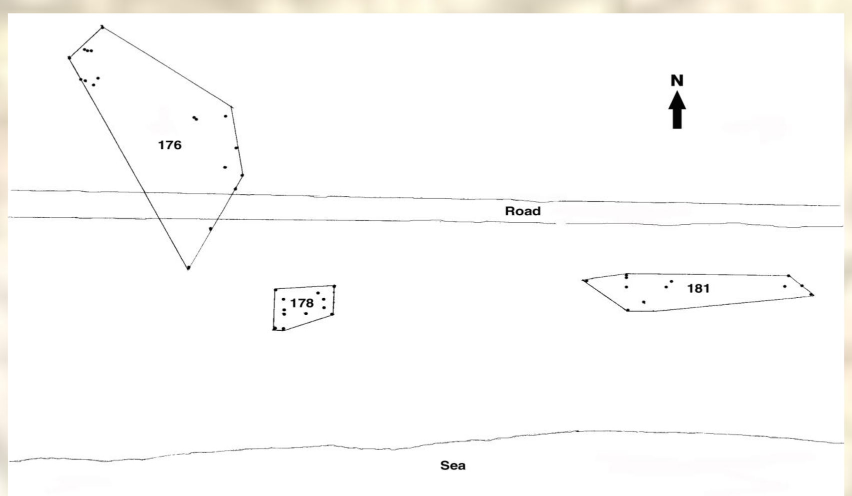
Differences in the range of the population density are prospective like in other chameleon species (Burrage, 1973). For the *C. namaquensis* the population density was 0.5-23.4 (mean 12.8) and for the *B. pumilum* 8-90 ind /ha in southwest Africa (Burrage, 1973). For *C. chamaeleon* in Cádiz, Spain was 20-25 ind/ha (Cuadrado, 1998). These differences could be explained by the difference in food availability, or the competition between species (Turner, 1977, Avery, 1980).

➢The mean SVL of the animals we used for radio tracking were 141.36cm and the mean weight 81.45g.
➢The mean distance of movements in 24 hours was **371.55cm for *C. africanus*** and **500.18cm for *C. chameleon*** (443.04cm for males and 542.58cm for females). No statistically significant difference was found among the distances of movements between the two species (t-test).
➢The maximum movement of the chameleons in 24 hours was 35m from a male from Pylos. Also a female from Samos was moved 20m.
➢The **home range** was **39.22 to 76.67m² in *C. chameleon*** and **53.28 to 441.91m² in *C. africanus***.

Home range of *C. chamaeleon*







Home range of *C. africanus*

A statistically significant difference was found in the size of home range between the two species. *C. africanus* has a larger home range than *C. chameleon* (χ^2 test). This could be because in Samos there are many more tall trees than in the study area in Pylos and we have not estimated the vertical home range (Mellado & Olmedo, 1992).Also *C. africanus* has larger food demands compare to *C. chameleon* (Dimaki *et al*., unpubl. data) and according to Spellerberg (1983) home range in lizards depends on the food demands. The population density of *C. africanus* is larger, so it would be expected that the home range of the species is smaller. That is not happening. This has been observed in other lizard species like *Uta stansburiana* and species of the genus *Sceloporus* (Rose, 1982).

Cuadrado (2001) has estimated the territory of the males of *C. chameleon* in 244±52m². Differences in the size of home range of a species from different studies have been recorded in the *Podarcis sicula* in Spain and Italy (Mellado & Olmedo, 1992).

In both chameleon species, our studies revealed home ranges that were smaller than those of other chameleon species recorded in literature. These differences could be due to the differences in population densities of the examined populations, the different food demands, and the different ecological parameters of each area (Rose, 1982; Mellado & Olmedo, 1992; Spellerberg, 1983).

C. africanus from Pylos (photo. M. Dimaki)

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