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Marine Turtle Newsletter

Newly Documented Epibiont Species from Nesting Loggerhead Sea Turtles (*Caretta caretta*) in Georgia, USA

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Loggerhead sea turtles (*Caretta caretta*) act as substratum for a wide variety of marine organisms (podd 1988). Frazier *et al.* (1985, 1991, 1992) and Frick *et al.* (1998) provide the most detailed reviews of the epibionts associated with loggerhead turtles in Georgia, USA. Collectively, these four studies reported ninety three epibiont species sampled :from loggerhead turtles nesting on six barrier islands: Blackbeard (31°28.4'N, 81°13.1 'W); Cumberland (30°50.0'N, 81°26.0'W); Jekyll (31°03.9'N, 81°24.9'W); Little Cumberland (30°57.2'N, 81°25.5'W); Little St. Simons (31 °15.4'N, 81°25.5'W); and Wassaw (31 ° 53.4'N, 81°58.4'W). This note reports seven previously undocumented epibiont species :from nesting loggerheads in Georgia.

During the 1998 nesting season (May -August), 40 turtles were sampled for the occurrence of previously undocumented epibiont species. Sampling was conducted on Jekyll Island (n=12), Little Cumberland Island (n=5) and Wassaw Island (n=23). The methods employed for sampling nesting loggerheads are as described in Frick *et al.* (1998). Specific and common names (where present), location and prevalence data of all newly documented species are given in Table 1.

<http://www.seaturtle.orgimtn/archives/mm88/mm8.8p3.shtml>

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Species	Common Name	Locality	Prevalence
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1(2.5%)

2(5.0%) 1(2.5%)

2(5.0%)

1(2.5%)

Table 1. ~fuioms Collecttdi"am C~ (~in Geargit, USA, 1998. Dttt m the mmlber af1mt1Qs ¥Im1 whkh the epfu~ was fu1md with the percttt. o(~e in p~es: s8U3plt sm (1Q = 40 1mt1Qs. J= Jekyll IsImd, L= Little CumberImd IsImd, Ind W= Wess- IsImd.

A number of points are worthy of note regarding attachment of these species:

Epibiont Species I and II: *Astrangia danae* and *Balanus trigonus*

Four individual turtles harboured colonies of star coral (*Astrangia danae*). One turtle exhibited approximately 10 individual colonies (5-9.6 cm diameter) located on the posterior carapace (5th vertebral and pygal scutes). Three other turtles carried only small (3 cm diameter) single colonies also located on the posterior-most section of carapace. *A. danae* specimens were situated amongst large encrustations of the following barnacle species: *Chelonibia testudinaria*, *Balanus trigonus*, and *Chthamalus fragilis*. On one occasion *A. danae* was found overgrowing dead *C. testudinaria*.

Epibiont Species III and IV: *Mitreli* (=Astyris) *lunata* and *Bryopsis plumosa*

One turtle hosted numerous (n=24) specimens of the lunar dove snail, *Mitrella lunata*. All *M lunata* were found in mats of the green algae *Bryopsis plumosa*. *B. plumosa* was growing on the posterior marginal areas of the carapace amongst colonies of the sea squirt, *Molgula manhattensis*.

Epibiont Species V and VI: *Costoanachis avara* and *Stylactis hooperi*

Two turtles carried large numbers (n=14, n=23) of the greedy dove snail, *Costoanachis avara*. *C. avara* were found within accumulated sediment under and between large clusters of the wildflower hydroid, *Tubularia crocea*. Soft-shelled clams (*Sphenia antilliensis*) were also located in sediments with *c. avara*. One specimen of *C. avara*; which was relatively large for the species (2.1 cm long), was covered by the commensal hydrozoan, *Stylactis hooperi*.

Epibiont Species VII: *Diadumene leucolena*

One turtle had three propeller scars across the middle of her carapace. These were approximately 2cm deep and contained approximately 200 individual sea anemones (*Diadumene leucolena*). The majority of individwils within the colony were green, however, occasional orang~--brown specimens were present. Individual anemones were approximately 1.5 cm tall (withdrawn).

Although epibiotic organisms occur on all seven species of marine turtles, loggerhead turtles have been shown to host the largest and most diverse communities (Frick *et oZ.* 1998). The epibiont species reported withfu this note are common fouling organisms in the southeastern USA (Fox & Ruppert 1985). However, their appearance as epibionts on sea turtles has not been well documented.

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Frazier *et al.* (1992) suggest that epibiotic occurrence and load may be attributed to irregularities and microeddies found on the carapace from natural processes such as shedding or from carapace damage. Such attachment sites may provide relatively sheltered habitat for fragile or turbulence intolerant epibionts like *Diadumene leucolena*. Propeller scars undoubtedly offer some degree of refuge from natural turbidity as well as from any stress that might occur as a result of epibiotic drag (Wahl 1996).

Similar microhabitats may also be created following the colonization of barnacles, tunicates, and other aggregated epibiont species. The collection sites we report for certain epibionts mentioned within this note (*Astrangia danae*, *Costoanachis avara*, and *Sphenia antilliensis*) suggest that there are benefits associated with the gaps and sinuses produced by large encrustations of sessile epibionts. For example, epibionts like *S. antilliensis* and *C. avara* abounded within the sediments accumulated under and between mats of *Tubularia crocea*. Additionally ~ all specimens of *Astrangia danae* observed on loggerhead turtles resided on the shells of either *Chthamalus fragilis*, *Chelonibia testudinaria*, or *Balanus trigonus*. No specimens were seen affixed directly to the carapace. Whether or not *A. danae* is unable to attach directly to the carapace is unknown. Caine (1986) noted the occurrence of *Porites porites*, the only other 'hard' coral reported as an epibiont on loggerhead turtles, but did not specify how specimens were attached.

Small *A. danae* colonies (3 cm diameter) did not appear to affect their respective host barnacles. However, one large colony of *A. danae* (9.6 cm diameter) was found completely overgro~ the opercular plates and sides of three *C. testudinaria*. All three barnacles were collected and dissected. Dissection revealed that the barnacles were dead prior to preservation. It is unknown whether or not *A. danae* colonization contributed to *C. testudinaria* expiration or if colonization occurred post-mortem.

The occurrence of lunar dove snails (*Mitrella lunata*), as an epibiont on loggerhead turtles, may be explained by the affinity of this species for green algae as food (Ruppert & Fox 1988). However, our methodology did not allow us to determine whether or not *M. lunata* had actually ingested *B. plumosa*.

Many factors undoubtedly contribute to the presence or absence of epibiont species on loggerhead turtles. Predation, physical stress, disturbance, recruitment dynamics, and competition all might alter the distribution and composition of species within the epibiotic community. While it is apparent that we must initially report the community composition of epibiota on sea turtles, to better understand the relationship between a turtle and its epibiota we must also determine the patterns of distribution and abundance of species present as epibionts (community structure). By monitoring individually tagged sea turtles, biologists have the means to observe any changes or patterns in epibiont communities. If such research is conducted in conjunction with 'standard data' collected on captured or observed turtles (i.e. morphometrics, scars, tag numbers, etc.), epibiont data can be utilized as an important supplement to existing databases. For example, Eckert and Eckert (1988) used epibiont data to infer pre-reproductive migration routes in leatherback turtles (*Dermochelys coriacea*) from Sandy Point, St. Croix, U.S. Virgin Islands. Similarly, Killingley and Lutcavage (1983) suggested movement patterns for loggerhead turtles using ^{18}O and ^{13}C profiles from epizoic barnacles. Moreover, Caine (1986) used epibiont data to document the presence of two discrete assemblages of loggerhead turtles along the east coast of the US which was later supported by mitochondrial DNA evidence reported by Bowen et al. (1993).

With the availability of published information regarding the natural history and environmental requirements of marine invertebrates, particularly fouling communities, it may be possible that concise~ standardized, and continuous epibiont research could be a significant tool for monitoring sea turtle migrations. Advanced technologies like radio or sonic tagging could easily be used to verify the reliability of information gathered from epibiont sampling.

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