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ETHOLOGY OF NEON DAMSEL FISH, *POMACENTRUS COELESTIS* JORDAN AND STARKS, ALONG THE NORTHERN COAST OF TAIWAN[1]

KUN-HSIUNG CHANG AND RONG-QUEN JAN

Institute of Zoology, Academia Sinica, Nankang,
Taipei, Taiwan 115, Republic of China

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Kun-Hsiung Chang and Rong-Quen Jan (1983) Ethology of neon damsel fish, *Pomacentrus coelestis* Jordan and Starks along the northern coast of Taiwan. *Bull. Inst. Zool., Academia Sinica* 22(1): 1-12. The behaviour of neon damsel, *Pomacentrus coelestis* Jordan and Starks, was studied using SCUBA gears along coast of northern Taiwan. In summer, the fish tended to aggregate in the mid-water, or to form small groups near the reef surface, depending on the number of individuals which gathered, *i.e.*, the more the fish gathered, the higher the fish might ascend to the water column. Heavy spawning occurred from June to August. Burrows bored by sea urchin *Echinometra mathaei* were often selected as nesting sites on reef flat. The male set up a breeding territory and, during nesting, defended the territory, especially against conspecifics, by motions such as threatening, chasing, and head-tail beating. After spawning the male cared for eggs. Both social and reproductive behaviours are discussed in relation to the same species, for which comparable behaviour patterns have been reported.

The ethology of pomacentrids has engaged much attention of behaviourists in recent years. These fishes, widely distributed in tropical, subtropical and temperate waters, are well-known for their highly habitat-associated behaviours. Among published papers, it is found that little has been done on genus *Pomacentrus* (Belk, 1975; Low, 1971; Moyer, 1975), as compared with those done on genus *Abudefduf*, and *Chromis* (Abel, 1961; Fishelson, 1970; Fishelson, *et al.*, 1974; Myrberg, *et al.*, 1967; Nakazono, *et al.*, 1979; Swerdloff, 1970a, b). And most works deal with the reporduction of these damselfishes (Boer, 1981; Keenleyside, 1979; Schmale, 1981). The discovery of spawning site selection may contribute to the classification of reproduction guilds (Balon, 1975; 1981b), and to shed light in explaining the evolutionary trend of the fish (Balon, 1981a; Baylis, 1981).

Pomacentrus coelestis Jordan and Starks is a widely ranged damselfish which distributes from eastern Australia to Korea, and Japan (Allen, 1975; Baik, 1980); and is very abundant along the northeast coast of Taiwan. Only a limited amount of works have been done in this species; Matsuoka (1962) described the spawning of *P. coelestis* in Japanese waters. Since behaviour and ecology of a single species may vary geographically, e. g., the territory size of *Chromis chromis* at Azores is larger than that of the Mediterranean *C. chromis* (Abel, 1961; Mapstone and Wood, 1975) and the feeding habit of *Abudefduf saxatilis* in Eilat is somewhat different from that in Marshall Islands (Fishelson, 1970; Hiatt and Strasburg, 1960), a study on the social and reproductive behaviours of *P. coelestis* in northern Taiwan would offer

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new comparable data to decipher geographic variation in these behaviours.

METHODS

Monthly field trips to the coast of Yieliu Peninsula (Fig. 1) on northern Taiwan were made from March 1980 to June 1982. Observations were conducted using snorkel and SCUBA gears at depths down to 20 m. On each visit to the study area, habitats of the fish were surveyed and notes were kept of the social behaviour of fish individuals. The sociological terms such as "school" and "shoal" were defined after Fishelson *et al.* (1974). During the spawning season, the reproductive behaviour was observed intensively. Depths and water temperatures were read from wrist gauges. Notes were written underwater on a water-resistant notebook.

DESCRIPTION OF THE STUDY AREA

Steep sandstone cliffs and slopes buttressed by large angular rocks make up the shoreline.

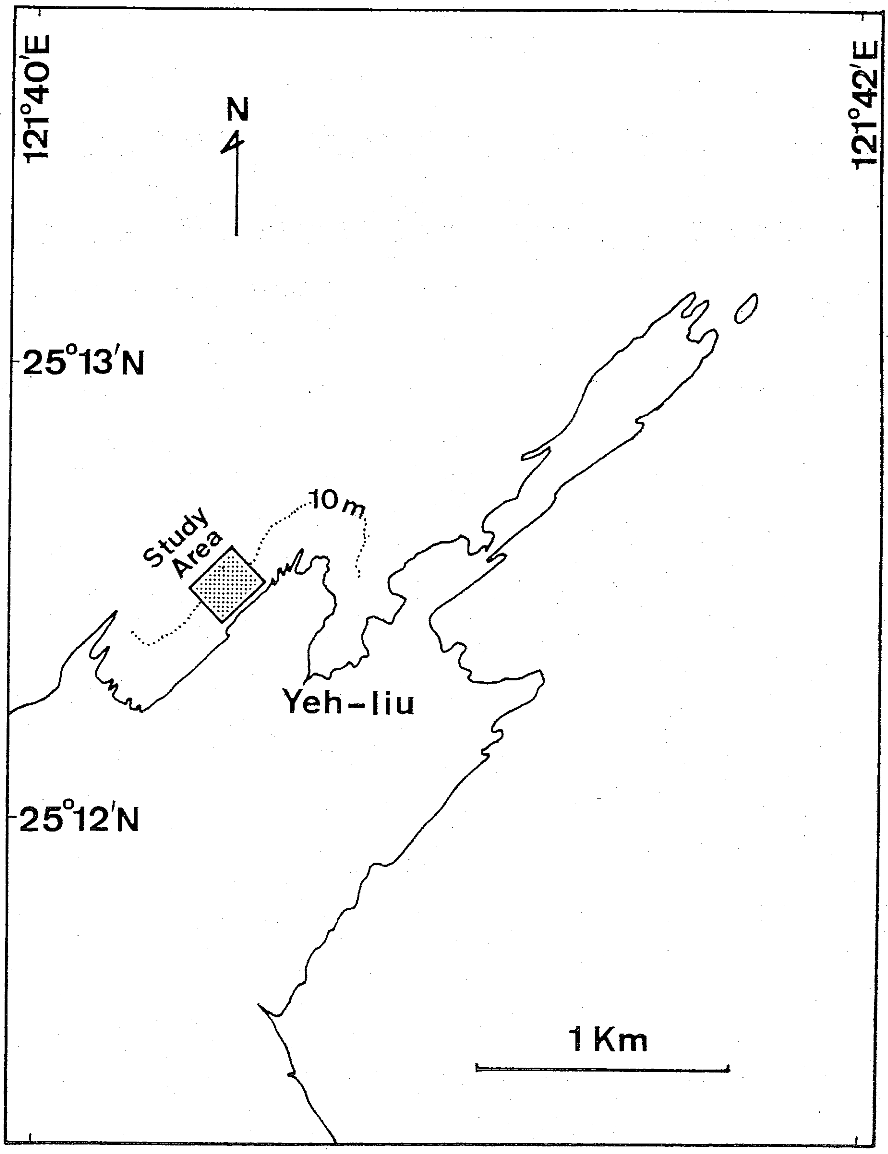

Fig. 1. Map of the Yieliu Peninsula, showing the study area.

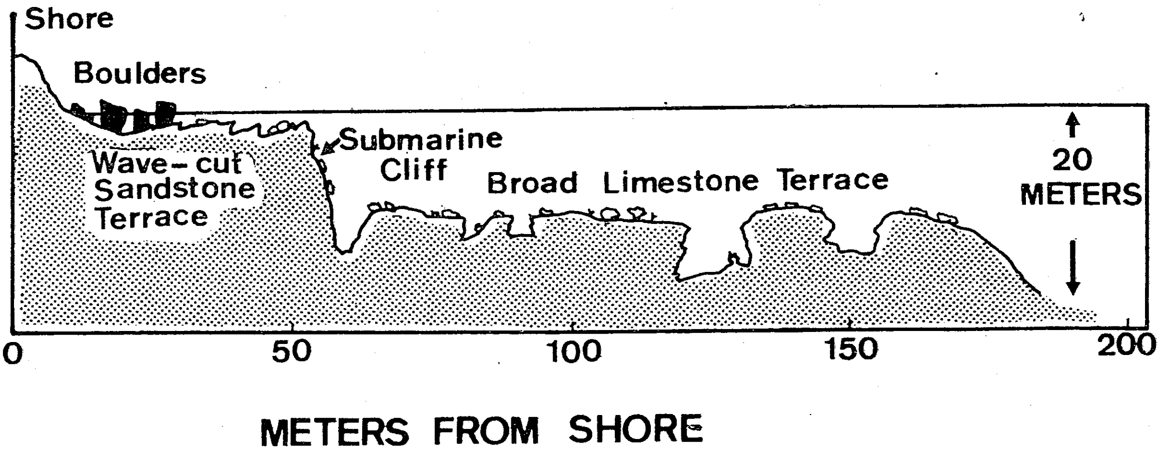

Fig. 2. Profile of the study area.

A profile of the study area is presented in Fig. 2. Coral development in the study region is still in a stage of "coral community" formation (Randall and Cheng, 1977; 1979), which consists of scattered coral colonies growing upon a substrate which was not built up by the accumulation of their own skeletal material. The innermost structural feature of the region is a shallow wave-cut sandstone terrace about fifty meters wide. The upper surface of the terrace is irregularly cut by low cuestal ridges which more or less parallel to the shoreline. Water remains in holes and troughs during low tide, although many boulders appear to be exposed during such time. A few encrusting patches of corals are found in the shallow troughs and small clumps of *Pocillopora* sp. occur occasionally on the outer part of the terrace. The outer margin of the wave-cut terrace is bordered by a submarine cliff which is irregularly indented by large cracks and channels. Tufts of articulated coralline and other benthic algae predominate on the outer wave-cut terrace.

A broad limestone terrace slopes gently downward from the base of the submarine cliff. Near the cliff the terrace is interrupted at places by sand and boulder floored channels. A rich variety of corals cover the upper surface and sides of the buttresses.

Furthermore, the terrace is characterized by the ubiquitous caves burrowed by sea urchins such as *Echinometra mathaei*, *Echinostrephus aciculatus*, and *Echinostrephus molaris*. The tally of fishes recorded in the study area is 60 in 1980 (Chang, unpublished data), among them *Pomacentrus coelestis* is by far the most abundant one. The solitary damselfish, *Stegastes fasciolatus*, distributing loosely, is conspicuous for its strong territoriality.

RESULTS

Spatial distribution and aggregating behaviour of *P. coelestis*

A population of more than two thousand individuals devided into several aggregations was observed along the shallow subtidal area. In Frebruary, when northeast monsoon still prevailed in the northern Taiwan, scattered clumps of five to fifteen individuals formed by recruiting juvenile fish of 10 to 25 mm total length were commonly observed in the murky water. These small fish swam countercurrently in the water column close to substrate among reef outcrops. While those individuals of more than 25 mm in total length and nearly of the same body size would form shoals of 10 to 25 individuals roving over the limestone terrace. While swimming along submarine cliff, the shoaling fish would descend slowly, but never so deep as to reach the sandy bottom, thereafter, ascend to the top of the cliff to meet the strong current. On the wave-cut sandstone terrace, individuals of various body sizes were spreading out. The fish are so numerous that they easily clumped themselves together close to shelters such as small troughs or caves burrowed by sea urchins.

In May, when the sea was still rough, each shoal composed of more individuals was observed to swim around a restrict area (*e.g.* the limestone terrace). The fish in aggregation were occasionally found to swim unidirectionally and perform stereotypic schooling behaviour. Sometimes the fish in a school would split into two or three subgroups, heading in different directions. When they met, they would aggregate again to perform synchronized spontaneous actions as they previously did in the school. Meanwhile, schools of subadult wrasse *Thalasoma lunare*, of which the caudal fin possessed a same yellow color as did in that of *P. coelestis*, would swim by. But there were not any mixing school observed. Individuals of cleaning wrasse, *Labroides dimidiatus*, were usually observed swimming in the vicinity of the schooling *P. coelestis.*

For those shoals of *P. coelestis* swimming along the terrace or penetrating the submarine cliff, they would always mix with schools of juvenile damselfish *Chromis notatus*. Over the outer edge of the cliff, heterospecific assemblies, as described above, would form for a short time and act together. Each individual swam in a speed equal to that of the current and thus the aggregating fishes as a whole stayed in one place.

In calm water, clumps of *P. coelestis* spread out over the terrace in a constant manner. Juvenile fish (16 to 25 mm total length) stayed close to shelters such as coral patches of crests on the terrace. Larger fish (25 to 45 mm total length) were found at a distance of about 40 cm from the floor and sometimes swimming into and out of the holes burrowed by sea urchins.

The fish larger than 45 mm total length usually distributed loosely among smaller ones over their habitats. Only rarely may solitary individuals of this size be observed to swim higher than 0.5 m above the substrate.

In September and October when the sea was commonly calm, hundreds of juvenile fish occurred in swarms in the mid-water column above the limestone terrace, to form a scene as "fish curtains" (Fig. 3). Any intruder (divers,

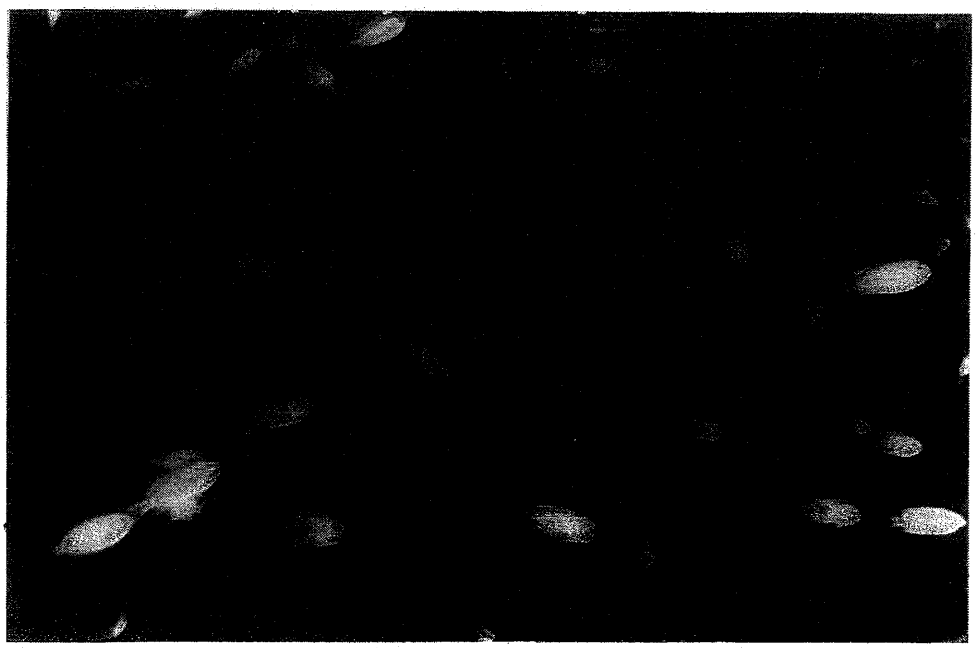

Fig. 3. "Fish curtain" of *Pomacentrus coelestis*, formed in the mid-water column above the limestone terrace.

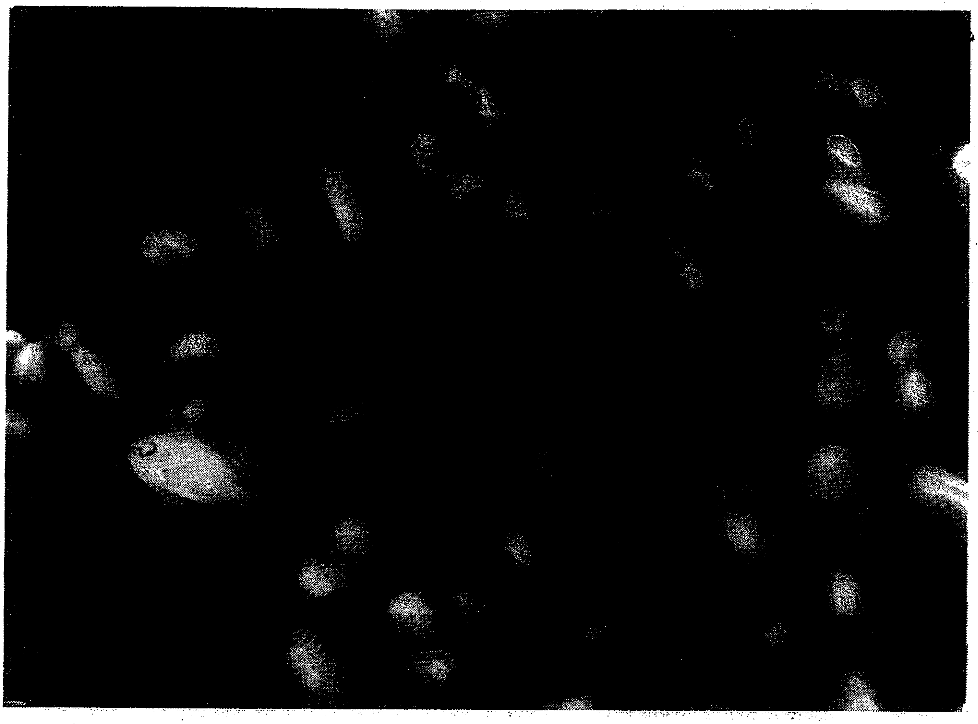

Fig. 4. *Pomacentrus coelestis* stayed among branches of coral *Stylophora* sp. through the night.

for example) toward which these fish moved slowly, would distrub this "fish curtain". The frontal fish attracted by the intruder would approach to him, then stopped at a distance of about 30 cm before him. Meanwhile, the fish following would go on swimming to make the frontal end of the swarm denser and denser. "Fish curtain" would then split in the distant part of the swarm in which the fish still swam in uncertain directions.

Windy season began when northeast monsoon rose in the middle October. From then on sediments stirred from the sea floor clouded the waters. Large aggregation disappeared from November to next March. In those days the fish were mostly scattered singly or in small groups along different sites on the terrace.

Diurnal behaviour of *P. coelestis*

P. coelestis, like most damselfishes, is a diurnal species. At dusk, they hide themselves among coral colonies, or on the terrace, where they stay through the night (Fig. 4). As morning comes, they gradually move out and then ascend to the water column.

One observation was made in August at 05:30. As schools of nocturnal sweeper, *Pempheris vanicolensis*, disappeared gradually, *P. coelestis* became more active and spread out into the water column. About half an hour later, individuals of common body size started to aggregate and small feeding groups formed. *P. coelestis* fed nearly all day, but most intensively in the morning and evening. While feeding close to the substrate, the fish usually gathered in a group of 10 to 30 individuals above reef outcrops or terrace, to take sessile organisms and algae. It was common to see clumps of *P. coelestis* feeding near the territory of damselfish *Stegastes fasciolatus*. The strong defense behavior of *S. fasciolatus* seemed invalid against these trespassers; for only the feeding of those being chased was interrupted, while other fish seemed undisturbed. Clumps of individuals usually stayed in one location to feed heavily for a while, then moved to another place. These clumps would disintegrate at dusk when components left for shelters as other solitary ones did.

Feeding aggregations comprised of hundreds of individuals were also seen spreading in the water column over the limestone terrace. Components of the swarm would not stay in a constant site relative to one another, but swam in various directions. In the afternoon, the "height" of the swarm, *i. e.*, the distance from the individual swimming on the top of an undisturbed swarm to the sea floor, was significantly correlated to logarithm of the numbers of individuals in the aggregation ($P<0.01$, t-test) (Fig. 5). It seemed that the more individuals the swarm congregated the higher the swarm might reach. These aggregations disappeared at dusk by descending to sea bottom gradually, and split into small groups.

Most of the shoaling *P. coelestis* which fed in the water column above submarine cliff were accompanied by fishes such as *Chromis notatus*, and *Abudefduf vaigiensis*. Within this assembly, *C. notatus* shared the same living space with *P. coelestis* most of the time, compared with *A. vaigiensis* cruising from place to place in school in the upper column.

Stomach content analysis showed that the planktons they collected were mostly diatoms, fish eggs, copepoda, and hydromedusae. In addition, individuals also took filamentous algae from reef surface. A freshly cracked sea urchin *Echinometra mathaei* might attract groups of *P. coelestis*, but only individuals larger than 40 mm in total length would rush to it and bite the dispersed reproductive gland off the victim. Small individuals just hoved to and fro above it to collect scraps floating in the water.

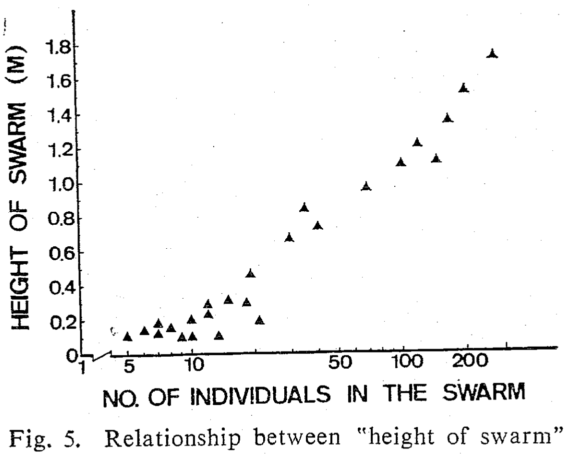

Fig. 5. Relationship between "height of swarm" and "number of individuals in the swarm". For details see text.

Reproduction

Breeding season of *P. coelestis* was assumed to begin before May when clumps of juveniles appeared in troughs interrupting the limestone terrace. Heavy spawning ocurred from June to August. In the field, body color of juvenile was generally bright blue in anterior part; yellowish on abdomen, posterior base of anal fin, and caudal fin. In spawning, the female displayed blue color on whole body except the caudal fin which was mainly yellowish. The spawning male was dark blue in body color. The upper part of caudal fin rays extended slightly (also see Allen 1975, p. 209). Male's caudal fin possessed a blue margin, and was apparently darker than that in the female or juvenile. Body sizes of most spawning male were in a range between 55 to 80 mm in total length, while the spawning female were a bit smaller, viz., 50 to 70 mm in total length. In addition, the nest-associated behaviour also helps to distinguish the spawning male.

Selection of nest site

The burrows bored by sea urchins on the wave-cut terrace and an isolated reef flat located on the limestone terrace, constituted suitable spawning localities for *P. coelestis.* Frequent observations suggested that their spawning sites were conditioned by the demamd of hidden places in which the fish laid eggs. Only those burrows bored by *Echinometra mathaei* were chosen as nests. Blind in one end or at least slightly bent characterized the burrows bored by *E. mathaei.* Furthermore, the diameter of these burrows were in a range of 6 to 7 cm, compared with 2.5 to 5 cm of those bored by sympatric *Echinostrephus aciculatus* and *Echinostrephus molaris.*

All the burrows selected by *P. coelestis* as spawning site were discarded ones, in which a little coral debris or sediment settled. During the selection, those burrows located close to crevices which were generally occupied by damselfish *S. fasciolatus*, were ignored.

Other spawning sites were located on the bottom of the channels interrupting the terrace near submarine cliff. Except *Tripneustis gratilla*, sea urchins were absent from the channels, where a heavy layer of sediment settled. A variety of caves were used as nests. In mid-August seven nests was observed clustering simultaneously in an area of about 4.5 m^2. The number of distributing nests did not seem to be limited by the area itself but mainly by topography, i.e., the existence of potential caves.

Preparation of nest

In the burrow or cave selected for nesting site, the male spent much time in nest preparation. Two conspicuous motions, i.e., fanning and mouth carrying, were involved in the procedures.

During fanning, the fish swam near the burrow and turned around to bring his caudal fin close to the entrance, then trembled with strong fin motions, and moved his body backward to agitate sediment. Fanning was conducted intermittently and each fanning comprised at least twice the trembling movements of the caudal fin. Sometimes the fish in the burrow would head out, stay laterally, and fan vigorously with pectoral fins.

While preparing nest on the bottom of channel, the fish spent the majority of time in fanning sediment away. As a clam shell on sea bottom was chosen as a nest site, the male settled outside the shell, with vigorous and rapid beats of the tail, to raise a cloud of sediment. Lighter sediment was carried away by water current; heavier materials settled on either side of the fanning site. A depression under clam shell was then created after repeated fanning actions were done.

Sand or coral debris inside the burrow or cave was carried in the mouth of the male to the open area. In one occasion, however, a male carried coral debris carefully from one burrow to deposit it in another in a distance of about 40 cm. What this action means is unclear. It cost nearly half a day for a male to prepare a nest on burrow on reef flat, and longer, viz., a day or more, to prepare a nest on channel bottom.

Territoriality

During the present investigation, only the nesting males were found to exhibit territoriality. The approximate territory boundaries of the nesting males extended to the water column in a radium of about 20 cm. The nests with which the fish was closely associated were clearly the focal point of the territory. Most of defence actions of the nesting male were induced by the approaching conspecifics, other species were generally ignored.

The territorial behaviour pattern includes:

(a) *Threatening*. The male stayed in the water column on the territorial boundary with dorsal, caudal, and anal fin erection. In the meanwhile, the blue body color of a territorial male would turn dark and a blue band present on the margin of both dorsal and caudal fins. Threatening display might be a mild interaction since no further aggressive action broke out between the displaying males and intruders.

(b) *Chasing*. In some occasions, the territorial male would dart straightly toward the conspecific intruders which clustered over his territory. It was found that only one intruder was defended each time, and the one chased would swim immediately away, to leave others in the cluster undisturbed. Most of the chasing behaviour were initiated by those males which ambushed in their nests, and the fish driven away were usually of body sizes smaller than that of the defender.

(c) *Head-tail beating*. When a conspecific fish of similar size approached, the territorial one would stay on the entrance of the nest, to watch the intruder for a while, then met it in distance of about 20 cm away from the nest. On reaching the intruder, the defending male would turn about, swim laterally backward, to beat the head of the intruder violently with its tail. In response to the head-tail beating mentioned above, the trespasser would also oriented head to tail, so that both fishes were close alongside and beat each other with their tails. Each bout of this head-tail beating lasted for 2 to 5 sec. After a short period of seperation, another bout commenced. At the end of the interaction, viz., 3 to 5 bouts later, the intruder would swim slowly away, under the watch of the defender.

Courtship and spawning

When the spawning male remained close to the substrate after establishing a territory, the females and non-territorial males would cluster in a distance of about 30 cm above the reef flat, or about 50 cm above the nest on the channel substrate. Typically, courtship commenced in the form of invitation when the spawning male darted from his nest to the fish clustering above. Intermingling the clustering fish for a few seconds, the male swam back, straight downward to the burrow or cave which was previously prepared. In some cases this inviting activity succeeded in leading gravid female into the nest. If a female received the invitation, she would follow quickly into the territory, and enter the nest. Because of the narrow opening of the nest, it was difficult to observe what happened inside the nest or whether they spawned or not. It was found by examining the nests, however, that the females laid eggs only on the undersurfaces and inner walls on the burrows or caves. Both the male and female would stay in the nest for a period varying from seconds to several minutes, then the female swam out, with the male chasing violently behind. When the spawning female fled, the male would turn back and re-enter the nest, then, another bout of inviting activity commenced.

As spawning male entered and hided himself in the nest, his body color would turn from blue to murky. This murky color would fade within a few seconds as the fish left his nest. During the invitation, the male entered the nest frequently and led to the maintenance of murky body color. During the courtship the sequential invitation might contribute to the assumption that *P. coelestis* was a polygamous species that a male spawned with several

Fig. 6. A male fanning eggs which attached on the inside wall of the burrow.

gravid females. Still there were not any long-term pair-bonding observed. By examining six nests dispersing in the channel in August, the average area which egg layer covered was about 17 cm², and in each cm² there were about 115 cylindrical eggs.

Caring of eggs

During incubation, the male would be obligated to take care of the eggs. Under this circumstance, the male was engaged mostly in guarding, warding off intruders, and egg-fanning.

While guarding, the male stayed watching near the entrance of the nest, and sometimes cruised nearby to show much aggression toward trespassers. Egg-predators such as *Halichoeres melanochir*, *Gomphosus varius* were usually warded off by violent chasing. And in some cases defendence was also observed to extend to the agonistic *Stegastes fasciolatus* which was passing by. It was, however, often a quiet front around the nest as there were no intruders. And it was common that the male swam into the nest instead of watching, to fan the eggs (Fig. 6). While fanning, the caudal fin stirred water mass around the eggs violently, and presumably cleaned the sediment settling on the eggs and aerated the eggs by agitating the surrounding water.

No feeding excursion was observed on the nest-guarding male. In August when the water temperature was about 28°C, the eggs hatched in 4-5 days after spawning. The male would nip away remnants of the spawn, then leave. The nest was no longer occupied after hatching of the young, till another reproductive bout began. Then whether or not the nest occupied by the original host was not understood.

DISCUSSION

P. coelestis is a diurnal species. It feeds mainly in the morning and evening. Hobson and Chess (1978) reported that *P. coelestis* was numerous in strong current areas near inter-island passes in Eniwetak Atoll, Marshall Islands. They also pointed out that *P. coelestis* generally stationed itself low in the water column above outcroppings of rock and rubble. This is similar to what happened to the local *P. coelestis* feeding over the submarine cliff in the present study. It is, however, that *P. coelestis* is also found feeding on the reef surface or aggregating in the water column over limestone terrace.

In present study we found that *P. coelestis* took filamentous algae from reef surface, similar food habit of this species was also noted by Allen (1975). When *P. coelestis* fed in the reef surface, they usually invaded territory of *Stegastes fasciolatus*. Robertson and Polunin (1981) reported that *S. fasciolatus* shared symbiotically feeding territory and algal food with surgeonfishes. It might not be the same relationship between *S. fasciolatus* and *P. coelestis*, since the latter fish does not defend the co-areas as done by surgeonfishes. Besides, while feeding in the territory of *S. fasciolatus*, *P. coelestis* in groups are possible to act a circumventing strategy, as pointed out by Robertson *et al.* (1976) in parrotfish *Scarus croicensis* which in schools fed at higher rates and were attacked by territory owners less often than nonschooling individuals.

Formation of aggregation only happened while the fish feeding in the mid-water column. In the study area, "fish curtain" of *P. coelestis* is similar to the "stream" formed by *Chromis dispilus* in New Zealand (Russell, 1971). Here the word "curtain" is used to emphasize the static outline of the aggregation. In the present study we also found that the more fish the aggregation included the higher this aggregation might reach (Fig. 5). It implies that the fish would ascend to the mid-water column where less fishes venture rather than deploy planely on the surface, and, if possible, the fish might make it by dint of forming aggregation. The function of aggregation in *P. coelestis* might not contribute much to minimize the energy required during swimming as did in some carangiform fishes (Breder, 1965; Weihs, 1973), since the fish usually stationed in the water column. Hobson (1968) discussed the benefit that might gained by aggregators. He suggested that any benefit the fish in a school might obtain in minimizing predation from confusion effect, or most other suggested mechanisms, would be shared by members of aggregations. Aggregation of *P. coelestis* probably has adaptive value under predation pressure as the individual is relative small, and vulnerable to predation if it ventures to water column solitarily.

To invite females to the nest, a variety of performance has been found in the male pomacentrids (Keenleyside, 1979). In the present study, the local spawning male would dash to invite the females clustering above the nest. Though the 0.5 m distance ventured in the dash is comparable shorter than those 4 m distances happening to *P. nagasakiensis* (Moyer, 1975), this dash and following motion might still be recognized as a signal jump, in accordance with the small size of *P. coelestis*. In his discussion, Moyer (1975) pointed out that *P. coelestis* did not exhibit signal jump in courtship moments in Miyake-jima (Japan) waters. Signal jump is presumed to function as display behaviour (Mapstone and Wood, 1975). Why *P. coelestis* performs signal jump in northern Taiwan but not in Miyake-jima waters is still unknown. Local population density has been inferred as a factor which may account for such behavioural difference. In *Chromis cyanea* different tactics were performed during courtship, high density males could rely on staying on the nest waiting for females to approach them, while low density males had to perform an elaborate courtship performance such as dipping and signal jump to lure the female to the nest (Boer, 1981). However, for further discussion quantitative data on behavioural difference of *P. coelestis* are still needed.

P. coelestis is a nest spawner while spawning. It selects burrows bored by sea urchin *Echinometra mathaei* as nesting sites on the reef, or cleans caves for spawning on the bottom of the channels on northern Taiwan. Therefore by definition it fits exactly into "hole nester" (speleophil) (Balon, 1975; 1981b), which is assumed to evolve Miocene (Balon, 1981a). Matsuoka (1962) reported that *P. coelestis* laid eggs on the "pocket" of flat rocky bottom and in the caves of rocks in the central Japan. Though he did not describe data concerning the formation of the "pocket" chosen as nest, it is apparent that the need of hidden places for his local fish to laid eggs is similar to what happened in northern Taiwan.

In some other damselfishes, they are also capable of modifying a suboptimal nesting site into an optimal one. This is found in *Chromis notata*, of which the male builds his nest in crevice on the sea bottom (Nakazono *et al.*, 1979), and in *P. nagasakiensis*, the male digs out sand, small shells and stones to prepare his nest under boulders (Moyer, 1975).

It is, however, noteworthy that *P. coelestis* constitutes nest on the channel bottom may cost more energy in nest-cleaning action than to prepare nest on burrows of reef flat, since in the latter case the nest must be modified from a completely buried cave instead of a prefabricated burrow. Furthermore, by the wave action in the channel bottom, the sediment would be caused to deposit on the nest to induce cleaning action of the nesting male. During observation, we also found that though it took more time (half a day or more) in nest preparation, some *P. coelestis* would rather nest in the caves of reef bottom than in the burrows of reef flat. This behaviour may imply that selective advantage other than ease of nest preparation and maintenance may exist to those fish which do not build their nests in the burrows.

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臺灣北部沿岸變色雀鯛 *Pomacentrus coelestis* Jordan and Starks 的行爲學研究

張崑雄　詹榮桂

變色雀鯛 *Pomacentrus coelestis* Jordan and Starks 是本省北部岩岸海域內的顯著魚種之一。本報告係報導筆者等於民國六十九年至七十一年間實地以水肺潛水的方式進行調查研究的結果。

變色雀鯛屬於日行性魚類，在冬季東北季風盛行期間，該魚分散於靠近海底罅穴或海流弛緩處。春末，部分變色雀鯛開始聚集於水層中，少數並且有羣游 (Schooling) 的現象。到了夏末秋初時，該種雀鯛的數量達到最多，當其在水層中聚集時，魚羣距海底的距離且與聚集中個體數量的對數值呈正相關。變色雀鯛主要以橈角類、魚卵及底藻爲食。當其攝食時，有些個體會組成十隻到二十隻之間的小羣，進入具有强烈領域行爲的太平洋眞雀鯛 *Stegastes fasciolatus* (Ogilby) 的領域之中。變色雀鯛於春天三月左右開始產卵，至八月時產卵個體達到最多。產卵時由雄魚負責築巢，築巢行爲包括地點的選擇以及巢穴的清理等。其築巢的地點主要包括礁石上梅氏長海膽 *Echinometra mathaei* (de Blainville) 所噬掘的洞穴，以及一些礁溝內沉積物覆蓋着的溝底礁石下的小洞穴。變色雀鯛的生殖爲一夫多妻制 (Polygamous)；護卵的工作完全由雄魚負責。