

THE BROWN GARDEN SNAIL (HELIX ASPERSA MULLER)^{1/}
(PULMONATA - HELICIDAE)

G. W. DEKLE

INTRODUCTION: THE BROWN GARDEN SNAIL (EUROPEAN BROWN SNAIL) HELIX ASPERSA MULLER, WAS DESCRIBED BY O. F. MULLER IN 1774 FROM SPECIMENS COLLECTED IN ITALY. THIS PLANT FEEDER HAS BEEN DISSEMINATED INTO MANY PARTS OF THE WORLD INTENTIONALLY AS A FOOD DELICACY, ACCIDENTALLY BY THE MOVEMENT OF PLANTS, AND BY HOBBYISTS WHO COLLECT SNAILS. SNAILS BELONG TO THE CLASS GASTROPODA, AND ARE RELATED TO THE CLAMS AND OYSTERS WHICH BELONG TO THE CLASS PELECYPODA. THEY PREFER AN UNDISTURBED HABITAT WITH ADEQUATE MOISTURE AND A GOOD FOOD SUPPLY. THE SNAIL BODY IS PROTECTED BY A HARD SHELL, USUALLY MARKED WITH SPIRALS (FIG. 1). MOST LAND SNAILS ARE NOCTURNAL, BUT FOLLOWING A RAIN MAY COME OUT OF THEIR HIDING PLACES DURING THE DAY. THEY MOVE WITH A GLIDING MOTION BY MEANS OF A LONG FLAT MUSCULAR ORGAN CALLED A FOOT. MUCUS, CONSTANTLY SECRETED BY GLANDS IN THE FOOT, FACILITATES MOVEMENT AND LEAVES A SILVERLIKE SLIMY TRAIL. THE REPRODUCTIVE ORGANS OF BOTH SEXES OCCUR IN THE SAME INDIVIDUAL AND EACH IS CAPABLE OF SELF-FERTILIZATION, ALTHOUGH CROSS FERTILIZATION IS NORMAL. ADULTS DEPOSIT EGGS. IDENTIFICATIONS OF SNAILS IN FLORIDA ARE MADE BY DR. ROBERT M. DEWITT, ASSOCIATE PROFESSOR OF ZOOLOGY, UNIVERSITY OF FLORIDA, AND DR. FRED G. THOMPSON, ASSISTANT CURATOR, FLORIDA STATE MUSEUM AT GAINESVILLE. SPECIMENS ARE DEPOSITED IN THE FLORIDA STATE MUSEUM AND THE FLORIDA STATE COLLECTION OF ARTHROPODS.



FIG. 1. VARIOUS STAGES OF DEVELOPMENT OF BROWN GARDEN SNAIL. SPECIMEN AT LEFT IS FULLY MATURE. (ACTUAL SIZE)

DESCRIPTION: SHELL LARGE, GLOBOSE, RATHER THIN, IMPERFORATE OR NEARLY SO, MODERATELY GLOSSY, SCULPTURED WITH FINE WRINKLES. IT IS YELLOW OR HORN-COLORED WITH CHESTNUT BROWN SPIRAL BANDS WHICH ARE INTERRUPTED BY YELLOW FLECKS OR STREAKS. THE APERTURE IS ROUNDLY LUNATE TO OVATE-LUNATE, THE LIP TURNED BACK. ADULT SHELLS (4-5 WHORLS) MEASURE 28-32 MM IN DIAMETER (BURCH 1960).

LIFE HISTORY: MATING REQUIRES 4 TO 12 HOURS. OVIPOSITION OCCURS 3 TO 6 DAYS AFTER FERTILIZATION. WHITE SPHERICAL EGGS ABOUT 1/8" IN DIAMETER ARE DEPOSITED IN A NEST CONSTRUCTED BY THE SNAIL. THE NEST IS ABOUT 1 TO 1-1/2 INCHES DEEP. BASINGER (1931) REPORTED THAT THE NUMBER OF EGGS LAID DURING EACH OVIPOSITION AVERAGED ABOUT 86. THE EGG MASS IS CONCEALED BY A MIXTURE OF SOIL WITH SECRETED MUCUS FOLLOWED BY A QUANTITY OF EXCREMENT. FREQUENCY OF OVIPOSITION IS SUBJECT TO TEMPERATURE, HUMIDITY, AND SOIL CONDITIONS. LOW TEMPERATURE AND LOW HUMIDITY INHIBIT THE ACTIVITY OF THE SNAIL, AND DRY SOIL IS UNSUITABLE FOR THE PREPARATION OF A NEST. DURING WARM DAMP WEATHER, OVIPOSITIONS MAY BE AS FREQUENT AS ONCE A MONTH. LOW HUMIDITY AND COLD TEMPERATURES GREATLY INHIBIT THE ACTIVITY OF THE SNAILS DURING THE FALL AND WINTER MONTHS. IF EACH INDIVIDUAL IS CAPABLE OF LAYING EGGS ONCE EVERY 6 WEEKS FROM FEBRUARY TO OCTOBER, THEN APPROXIMATELY 5 OVIPOSITIONS ARE MADE EACH YEAR AND 430 EGGS LAID (BASINGER 1931). DURING THE SUMMER MONTHS, THE EGGS HATCH IN ABOUT 2 WEEKS. THE SHELLS OF HATCHLINGS ARE FRAGILE AND TRANSLUCENT. MATURITY REQUIRES ABOUT 2 YEARS IN SOUTHERN CALIFORNIA. IN SOUTH AFRICA THE SNAILS TAKE ABOUT 10 MONTHS TO BECOME MATURE, PRODUCING ONE GENERATION A YEAR (GUNN 1924). WHEN DRY CONDITIONS PREVAIL, THE SNAIL MAY SEAL ITSELF TO VARIOUS OBJECTS OR CLOSE THE SHELL OPENING WITH A PARCHMENTLIKE EPIPHRAGM. WITH THE ADVENT OF HUMID CONDITIONS, THE SNAIL AGAIN BECOMES ACTIVE.

DISTRIBUTION: BURCH (1960) REPORTS NATURAL DISTRIBUTION IN BRITAIN, WESTERN EUROPE, AND ALONG BORDERS OF THE MEDITERRANEAN AND BLACK SEAS. IT HAS BEEN INTRODUCED INTO THE ATLANTIC ISLANDS, SOUTH AFRICA, HAITI, NEW ZEALAND, AUSTRALIA, MEXICO, CHILE AND ARGENTINA. IN THE UNITED STATES IT HAS BEEN INTRODUCED INTO SOUTH CAROLINA, LOUISIANA, AND CALIFORNIA.

HOSTS: BUXUS MICROPHYLLA 'JAPONICA' (CALIFORNIA BOXWOOD), CRINUM SP., CUPRESSUS SEMPERVIRENS L. (ITALIAN CYPRESS), GREVILLEA SP., HIBISCUS SPP., AND JUNIPERUS SPP., ROSA SP., AND OTHER UNIDENTIFIED PLANTS AND SHRUBS AT THE DAVIE, FLORIDA, INFESTATION (1969). GUNN (1924) LISTED 49 PLANTS AS HOSTS IN SOUTH AFRICA: **VEGETABLES:** CABBAGE, CARROT, CAULIFLOWER, CELERY, BEAN, BEET, BRUSSELS SPROUTS, LETTUCE, MANGEL, ONION, PEAS, RADISH, TOMATO AND TURNIPS. **CEREALS:** BARLEY, OATS AND WHEAT. **FLOWERS:** ALYSSUM, ANTIRRHINUM, ASTER, BALSAM, CARNATION, CANDYTUFT, CHRYSANTHEMUM, DIANTHUS, DAHLIA, DELPHINIUM, HOLLYHOCK, LARKSPUR, LILIES, MARGUERITE, MIGNONETTE, NASTURTIUM, PANSY, PENTSTEMON, PETUNIA, PHLOX, STOCK, SWEET-PEA, VERBENA, AND ZINNIA. **TREES:** APPLE, APRICOT, CITRUS, PEACH AND PLUM. **SHRUBS:** HIBISCUS, MAGNOLIA AND ROSE.

ECONOMIC IMPORTANCE: SNAILS FEEDING ON CULTIVATED PLANTS MAY BECOME SERIOUS PESTS. IN CALIFORNIA, ENORMOUS POPULATIONS SOMETIMES BECOME ESTABLISHED IN CITRUS GROVES AND CAUSE SERIOUS DAMAGE TO LEAVES AND FRUIT (BASINGER 1931). THEY ALSO CAUSE ECONOMIC DAMAGE TO TRUCK CROPS AND ORNAMENTAL PLANTS. LARGE NUMBERS OF SNAILS ARE A NUISANCE AROUND A RESIDENCE.

CONTROL: METALDEHYDE IS RECOMMENDED FOR CONTROL OF LAND SNAILS. IT MAY BE APPLIED AS A DUST (15 PERCENT METALDEHYDE BY WEIGHT), AS A LIQUID (20 PERCENT METALDEHYDE BY VOLUME), OR AS A BAIT (3-6 PERCENT MIXTURE WITH WHEAT, BRAN, CORNMEAL OR SIMILAR MATERIAL). FOLLOW SAFETY PRECAUTIONS ON MANUFACTURERS LABEL.

REMARKS: WE DO NOT KNOW HOW SERIOUS A PEST THE BROWN GARDEN SNAIL MAY BE UNDER FLORIDA CONDITIONS. IT HAS BEEN ERADICATED FROM TWO LOCATIONS IN FLORIDA SINCE 1963 BY THE DIVISION OF PLANT INDUSTRY. THE MOST RECENT INFESTATION AT DAVIE IS BELIEVED TO HAVE BEEN INTRODUCED ON A SHIPMENT OF CONTAINER-GROWN PLANTS FROM A CALIFORNIA NURSERY.

REFERENCES:

- BASINGER, A. J. 1931. THE EUROPEAN BROWN SNAIL IN CALIFORNIA. UNIV. CALIF. AGR. EXP. STA., BULL. 151:1-22; 16 FIG.; 6 TAB.
- BURCH, J. B. 1960. SOME SNAILS AND SLUGS OF QUARANTINE SIGNIFICANCE TO THE UNITED STATES. U. S. DEPT. AGR. RES. SER. 82(1):1-70; 15 FIG.; 4 PL.
- GUNN, D. 1924. THE BROWN AND GREY SNAILS: TWO DESTRUCTIVE GARDEN PESTS. JOUR. DEPT. AGR. (UNION OF SOUTH AFRICA) REPRINT NO. 42:3-10.