TADARIDA BRASILIENSIS

A "FREE TAIL," PROJECTING SIGNIFICANTLY BEYOND THE UROPATAGIUM (TAIL MEMBRANE), CHARACTERIZES FAMILY MOLOSSIDAE - "FREE-TAILED BATS."

MOLOSSIDS OCCUPY AN EXTREME MORPHOSPACE, WITH TADARIDA BRASILIENSIS EXPLOITING AN AERIAL NICHE REMINISCENT OF SWIFTS AND SWALLOWS. T. BRASILIENSIS POSSESSES RELATIVELY HIGH WING LOADING AND HIGH ASPECT RATIO WINGS, WHICH ENABLE RAPID, LONG-DISTANCE FLIGHTS AT RECORD-BREAKING SPEEDS OF 99.5 MPH.

HIGH ALTITUDES CONSTRAIN AERODYNAMICS, AND THUS, NECESSITATE ADAPTATIONS FOR EFFICIENT OXYGEN UPTAKE AND TRANSPORT. MOLOSSIDS, INCLUDING T. BRASILIENSIS, "HAVE SOME OF THE HIGHEST REPORTED HEMATOCRITS AND A SLIGHTLY LOWER OXYGEN AFFINITY THAN OTHER SPECIES" - AN INREDIBLE ADAPTATION FOR HIGH ALTITUDE FLIGHT.

DISTINCTIVE "THERMAL WINDOWS" OR "HOT SPOTS" ARE AN EXTRAORDINARY ADAPTATION, FACILITATING THERMOREGULATION. THESE HIGHLY VASCULARIZED, HAIRLESS WINDOWS MAINTAIN "HEAT BALANCE BY FLUSHING THE UNINSULATED THERMAL WINDOW WITH WARM BLOOD, THEREBY DISSIPATING HEAT WHILE BATS ARE FLYING UNDER WARM CONDITIONS, BUT SHUNTING BLOOD AWAY AND CONSERVING HEAT WHEN THEY ARE FLYING IN COOLER AIR AT HIGH ALTITUDES."

MALE TADARIDA PRODUCE COMPLEX MULTISYLLABIC SONGS - EACH MALE CONSTRUCTING A DISTINCTIVE MELODY OF "SEQUENCES, TEMPORAL STRUCTURES, AND A TIMED RHYTHM."
"SINGING [MAY HAVE] FIRST EVOLVED IN T. BRASILIENSIS IN SUPPORT OF MIGRATORY BEHAVIORS BY HELPING BATS IN TRANSIT QUICKLY FIND SUITABLE DAY ROOSTS WHEN PASSING THROUGH FOREIGN TERRITORY, AND SUBSEQUENTLY BECAME INTEGRATED WITH MATING BEHAVIORS BECAUSE SINGERS GAINED BETTER ACCESS TO MIGRATING FEMALES IN THE SPRING."

ECHOLOCATING BATS MANIPULATE THE ACOUSTIC PROJECTION PATTERN OF THEIR SONAR PULSE EMISSIONS. TADARIDA ACHIEVE THIS BY FINELY ADJUSTING THE SHAPE OF THEIR MOUTH CAVITY (BEAM-FORMING) - A BEHAVIOR SIMILAR TO SUPRALARYNGEAL SPEECH MOTOR CONTROL BY HUMANS.
RAISING THE NOSE TIP ALONE CREATES A SMALL APERTURE AND WIDE-ANGLE BEAM, AND SIMULTANEOUSLY RAISING THE FRONT AND SIDE LIPS CREATES A WIDER APERTURE WITH NARROWER BEAM.

PROTUBERANCES OR TUBERCLES ALONG THE DORSAL LEADING-EDGE OF THE EARS, RESEMBLE THE PECTORAL FLIPPER-TUBERCLES OF MEGAPTERA NOVAEANGLIAE (HUMPBACK WHALES). THESE PROTUBERANCES PRESUMABLY INCREASE MANEUVERABILITY AND DELAY STALL.