MEASUREMENTS OF TOTAL FRESH MASS FOR SOME SPECIES OF ODONATA FROM THE GREAT PLAINS OF THE UNITED STATES

Odonata mass data (M.L. MAY, 1981, *Odonatologica* 10: 279-291) are of interest in studies of physiology (M.L. MAY, 1976, *J. comp. Physiol.* 111: 55-70), energetics (M.L. MAY, 1979, *J. exp. Biol.* 83: 79-84), and ecology (M.L. MAY, 1984, *Adv. Odonatol.* 2: 95-116). For example, measurements of mass data have been used to study patterns of mass gain and sexual dimorphism in odonates (B.R. ANHOLT, J.H. MARDEN & D.M.JENKINS, 1991, *Can. J. Zool.* 69: 1156--1163). Because of the paucity of published mass data, Anholt et al. found it necessary to measure dry museum specimens and to infer fresh masses from allometric data.

The author had the opportunity during the summer of 1998 (July 12 through September 12) to collect Odonata in Kansas and Nebraska in the Great Plains of the United States, and to measure total mass of a number of species. Measurements were made, using a Scientech SA-120 electronic analytic balance, to an accuracy of 0.1 mg. Specimens were kept in glassine envelopes which were in turn stored in zip-lock plastic bags in a cooler until they could be weighed. Measurements were made of live insects within several hours of their capture.

Data have generally been included only for cases in which at least several specimens were weighed. In cases of special interest (e.g., for *Somatochlora ensigera*, for which a number of males were collected but only a single female) a lone data point may be reported for reference. Data are given as: n = number of specimens, m ± average mass 3 standard deviation (kg x 10^6), R = range of masses = minimum-maximum (kg x 10^6).

C a l o p t e r y g i d a e

Calopteryx maculata ♂: n = 15, m = 60.1 ± 9.8, R = 47.2-79.8

C. maculata ♀: n = 8, m = 63.1 ± 12.6, R = 41.1-76.8

C. aequabilis ♂: n = 27, m = 72.3 ± 7.9, R = 55.9-94.5

C. aequabilis ♀: n = 10, m = 81.5 ± 12.7, R = 61.4-104.4

(It is worthy of note that the *Calopteryx* specimens are from sympatric populations found at the Jumbo Valley Fen in Cherry County, Nebraska.)

Hetaerina americana ♂: n = 5, m = 86.9 ± 14.0, R = 70.9-104.0

H. americana ♀: n = 2, m = 117.6, R = 109.0--126.2

Coenagrionidae

Amphiagrion species ♂: n = 7, m = 16.4 ± 1.4, R = 15.1-18.8

Amphiagrion species ♀: n = 4, m = 24.1 ± 5.6, R = 17.3-30.5

Enallagma exsulans ♂: n = 3, m = 16.9 ± 0.6, R = 16.3-17.3

Aeshnidae

Aeshna multicolor ♂: n = 7. m = 640.7 ± 125.3, R = 477.0-781.7

Anax junius ♂: n = 8, m = 886.9 ± 85.3, R = 765.2--1,020.6

A. junius ♀: n = 5, m = 1,033.8 ± 219.3, R = 751.9-1,248.9

Nasiaeschna pentacantha ♂: n = 1, m = 583.1

Gomphidae

Gomphus externus ♂: n = 2, m = 354.2, R = 325.9--382.5

G. externus ♀: n = 2, m = 387.6, R = 374.5-400.6

Progomphus externus ♂: n = 7, m = 293.4 ± 36.5, R = 236.0-335.6

Ophiogomphus severus ♂: n = 2, m = 364.6, R = 363.9-365.2

O. severus ♀: n = 4, m = 400.7 ± 19.2, R = 379.3--417.0

Stylurus plagiatus ♂: n = 1, m = 342.6

Corduliidae

Somatochlora ensigera ♂: n = 8, m = 291.8 ± 21.9, R = 253.8-322.1

S. ensigera ♀: n = 1, m = 404.1 (ovipositing ♀)

Libellulidae

Celithemis eponina ♂: n = 4. m = 135.3 ± 9.2, R = 129.4-148.9

C. eponina ♀: n = 2, m = 170.3, R = 163.3-177.2

Leucorrhinia intacta ♂: n = 10, m = 112.1 ± 12.8, R = 99.6-138.5

L intacta ♀: n = 3, m = 140.4 ± 12.8, R = 130.7--154.9

It is interesting to observe the substantial range of mass variation in some of the larger taxa. *Anax junius*, which is known to be wide-ranging and migratory, is a particularly good example. More extensive measurements of variation of mass through the season and of mass constituents (water, muscle, cuticle, lipids) such as that accomplished by J.H. MARDEN (1989, *Physiol. Zool.* 62(2): 505-521) for *Libellula (Plathemis) lydia* would be of much interest.

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