



FIELD BODY TEMPERATURES  
OF  
TROPICAL AND TEMPERATE ZONE SALAMANDERS

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## INTRODUCTION

This report presents field body temperatures of salamanders, and summarizes previous reports of field body temperatures in the literature. In it we extend and update a similar survey (Brattstrom, 1963), which has proven invaluable in studies of amphibian thermobiology.

Table 1 presents temperature records for salamanders. Each record represents a salamander or series of salamanders measured at the indicated locality and usually at the same time of day. Also included when available is information on time of year, locality, elevation, and microhabitat. Temperatures without literature references were taken by us. We measured the temperature of the substrate immediately adjacent to newly discovered salamanders. Bogert (1952) has shown that substrate temperatures measured in this manner are generally equivalent to salamander body temperatures. All temperatures of tropical ambystomatids are for aquatic salamanders and larvae.

In Table 1 we include only those values from the literature that were gathered with similar techniques. Reports equating salamander body temperatures with air temperature or weather bureau records are not included. In most cases we have retained the taxonomic designation employed by the original source.

Table 2 summarizes annual variation in body temperature that might be experienced by salamanders in a single population. Because body temperatures of tropical salamanders vary with elevation (Feder and Lynch, 1982), we include only species for which winter and summer records are available at the same elevation. Similarly, we report on only those temperate species for which winter and summer records are available for comparable climates.

Table 3 reports maximum and minimum temperatures for each species. Unlike in Table 2, these temperatures often are not for single populations and may represent extremes of species ranges.

These data are valuable in several respects. In designing experiments, biophysical modelling, calculation of energy budgets, etc., it is important to know what temperatures an animal normally experiences in the field. Also, exceptional species that experience unusual thermal regimes can be identified only when the 'normal' pattern is known. Furthermore, these data are obviously significant in understanding the ecological and thermal relations of amphibians; the data form the basis of an analysis of field body temperatures of salamanders (Feder and Lynch, 1982) with this goal in mind. [Values in Table 1 gathered too late to be incorporated in the above study and in Tables 2-3 are designated by '\*\*\*'.]

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TABLE 1. FIELD BODY TEMPERATURE RECORDS FOR NECTROPICAL AND TEMPERATE ZONE SALAMANDERS.

Each record is for a salamander or series of salamanders collected at the indicated locality and usually at the same time of day. All temperatures are reported in degrees Celsius. Key to symbols and abbreviations: \*\*\* = Data gathered too late to be included in the analysis of Feder and Lynch (1982) or in Tables 2 or 3; n = Sample size of each series of salamanders; Gua = Guatemala; Mex = Mexico; Chis = Chiapas; Ver = Veracruz; Mich = Michoacan; DF = District Federal; Jal = Jalisco; Chih = Chihuahua; SLP = San Luis Potosi; Ibid = Identical to previous record except as indicated; SM trans = San Marcos transect, area described by Wake and Lynch (1976).

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
NEOTROPICAL SALAMANDERS					
A. PLETHODONTIIDS					
001	15.0			<u>Bolitoglossa</u>	<u>adspersa</u> Bogota, Colombia 2650 M Stebbins and Hendrickson (1959)
001	11.8		11.8-11.8	<u>Bolitoglossa</u>	<u>compacta</u> Aug 75 Cerro Respingo, Chiriqui, Panama 2700 M Wet forest under log
003	21.8	1.2	20.0-22.4	<u>Bolitoglossa</u>	<u>dunni</u> Aug 75 Mts W San Pedro Sula, Honduras 1550 M Bromeliad on trees in meadow
002	15.6	1.3	14.6-16.5	<u>Bolitoglossa</u>	<u>engelhardtii</u> Aug-Sept 72 San Marcos transect, Gua. 2090 M Bromeliad in wet forest
020	15.7	2.2	11.6-19.4	<u>Bolitoglossa</u>	<u>engelhardtii</u> Dec-Ja 71-72 SM Transect, Gua. 1900 M Bromel & logs in wet forest
004	16.6	1.8	14.0-18.0	<u>Bolitoglossa</u>	<u>franklini</u> June 70 SM transect 2350 M elev Wet forest bromeliads
003	16.6	2.0	14.4-18.4	<u>Bolitoglossa</u>	<u>franklini</u> Aug-Sept 72 Ibid. 2100 M
001	15.2			<u>Bolitoglossa</u>	<u>franklini</u> Ibid. 2450 M
004	12.6	0.3	12.3-12.9	<u>Bolitoglossa</u>	<u>franklini</u> Aug 75 Ibid 2125 M
004	10.5	1.0	9.0-11.0	<u>Bolitoglossa</u>	<u>franklini</u> Nov 74 2450 M Ibid
005	17.1	3.1	12.0-19.4	<u>Bolitoglossa</u>	<u>franklini</u> Dec-Ja 71-71 1950 M Ibid
002	13.8	2.0	12.4-15.2	<u>Bolitoglossa</u>	<u>franklini</u> Ibid 2350 M
003	12.8	1.4	12.0-14.4	<u>Bolitoglossa</u>	<u>hartwegi</u> Aug 75 Xantehuitz, Chis. Mex 2750 M Under logs clearing in wet forest
001	20.5			<u>Bolitoglossa</u>	<u>mexicana</u> Aug 72 Jitotol Road, Chis., Mex. 1650 M Under log in open pine woods
002	13.3	3.9	10.5-16.0	<u>Bolitoglossa</u>	<u>morio</u> Jun 70 SM Trans, Gua. 2750 M Under rock, log clearing in wet forest
002	12.0	2.0	10.6-13.4	<u>Bolitoglossa</u>	<u>morio</u> Dec-Ja 70 2850 M Ibid
001	16.5			<u>Bolitoglossa</u>	<u>nigroflavescens</u> Feb 72 Motozintla Rd, Chis., Mex 2150 M Bromeliad in wet forest
008	22.8	1.0	21.5-24.0	<u>Bolitoglossa</u>	<u>occidentalis</u> Aug 72 SM Trans 1100 M In banana plants
012	22.7	0.8	21.4-24.0	<u>Bolitoglossa</u>	<u>occidentalis</u> Aug 75 Ibid
009	27.4	1.2	24.5-28.4	<u>Bolitoglossa</u>	<u>occidentalis</u> Aug 75 Rd to Nueva Allemani, Chis. Mex. 600 M Banana plants
002	29.9	0.1	29.8-30.0	<u>Bolitoglossa</u>	<u>occidentalis</u> Aug 75 Cruz Blanca, Chis., Mex. 500 M In banana plants
012	20.9	1.1	19.0-22.4	<u>Bolitoglossa</u>	<u>occidentalis</u> Dec-Jan 71-72 SM Trans, Gua. 1100 M In banana plants
013	19.2	0.8	17.8-20.2	<u>Bolitoglossa</u>	<u>occidentalis</u> Feb 74 Ibid

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
002	24.3		24.0-24.6	<u>Bolitoglossa platydactyla</u>	Jul 79 Fortin de Los Flores, Veracruz, Mex 970 M In banana plants ***
005	14.9	1.2	13.2-16.0	<u>Bolitoglossa resplendens</u>	Jun 70 SM Trans, Gua. 2450 M Bromeliad, under rock in wet forest
002	09.1	1.6	08.0-10.2	<u>Bolitoglossa resplendens</u>	Ibid 2825 M Inside log and under rock
001	13.6			<u>Bolitoglossa resplendens</u>	Aug 72 9 Mi NW San Cristobal, Chis., Mex. 2500 M Under log oak-pine forest
001	13.0			<u>Bolitoglossa resplendens</u>	Aug 72 SM Trans, Gua. 2850 M In stump wet forest
004	11.9	1.0	10.5-12.4	<u>Bolitoglossa resplendens</u>	Dec-Jan 71-72 Ibid 2725 M Under log & in bromeliad, moist-wet forest
039	14.6	2.5	07.8-18.2	<u>Bolitoglossa rostrata</u>	Jun 70 SM Trans, Gua 2775M Under rocks&logs in meadow edge wet forest
033	14.6	1.2	13.0-17.4	<u>Bolitoglossa rostrata</u>	Aug-Sept 72 Ibid
029	13.4	0.8	12.2-15.5	<u>Bolitoglossa rostrata</u>	Aug 75 2775 M Ibid
051	10.5	1.8	08.0-14.0	<u>Bolitoglossa rostrata</u>	Dec-Jan 71-2 Ibid 2750 M
008	14.6	0.3	13.9-14.8	<u>Bolitoglossa rostrata</u>	Jul 70 Cuchumatanes, Gua. 2850 M Under rocks inside logs meadow woods edge
002	14.0	0.6	13.5-14.4	<u>Bolitoglossa rostrata</u>	Aug 75 Xantehuitz, Chis, Mex. 2750 M Rock ledge, bark road thru wet forest
036	08.2	2.0	05.5-12.5	<u>Bolitoglossa rostrata</u>	Nov 74 Ibid 2775 M
004	25.6	1.4	24.6-27.6	<u>Bolitoglossa rufescens</u>	Jul 79 3.3 Km E Penuela, Veracruz, Mex 600 M In banana plants ***
002	21.8	0.3	21.6-22.0	<u>Bolitoglossa rufescens</u>	Sept 72 Cuautlapam, Ver. Mex. 1250 M Banana plants in cafetal
001	20.0			<u>Bolitoglossa rufescens</u>	July 76 Ibid 1000 M
009	19.3	1.6	17.0-20.8	<u>Bolitoglossa rufescens</u>	Jan 74 Ibid 1250 M
002	14.4	0.0	14.4-14.4	<u>Bolitoglossa subpalmata</u>	Sep 61 Cerro Dela Muerte, Cartago Prov, Costa Rica 2760 M
015	12.8		09.8-16.0	<u>Bolitoglossa subpalmata</u>	Cerro de la Muerte, Costa Rica Nest site Vial (1968)
			07.5-12.0	<u>Bolitoglossa subpalmata</u>	Sep Cerro de la Muerte, Costa Rica 2926M Vial (1968)
			07.0-09.5	<u>Bolitoglossa subpalmata</u>	May Cerro de la Muerte, Costa Rica 3200 M Vial (1968)
600			02.8-23.8	<u>Bolitoglossa subpalmata</u>	Throughout year Cerro de la Muerte, Costa Rica 1500-3200 M Vial (1968)
188	08.8	0.6	06.4-12.8	<u>Bolitoglossa subpalmata</u>	Throughout year Ibid (active) Vial (1968)
001	16.6			<u>Chiropterotriton bromeliacia</u>	June 70 SM Transect, Gua 2400 M Bromeliad in wet forest
016	12.5	0.3	12.2-12.8	<u>Chiropterotriton bromeliacia</u>	Ibid 2650 M
002	14.8	1.1	14.0-15.5	<u>Chiropterotriton bromeliacia</u>	Aug-Sep 72 Ibid 2450 M
009	13.1	0.5	12.5-14.0	<u>Chiropterotriton bromeliacia</u>	Aug 75 2125 M Ibid
006	09.4	0.3	09.0-09.8	<u>Chiropterotriton bromeliacia</u>	Nov 74 Ibid 2450 M
015	13.7	1.4	12.4-15.2	<u>Chiropterotriton bromeliacia</u>	Dec-Jan 71-2 2350 Ibid
008	10.6	0.0	10.6-10.6	<u>Chiropterotriton bromeliacia</u>	Ibid 2600 M



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007	10.9	1.1	09.6-12.4	<u>Chiropterotriton chiropterus</u>	Jul 76 20 Km W Tres Cumbres, Morelos, Mex. 3130 M Under bark, chips fir forest
001	14.1			<u>Chiropterotriton chiropterus</u>	Jul 76 Above Xometla, Ver., Mex 2610 M Inside log in forest
006	10.8	0.4	10.2-11.2	<u>Chiropterotriton chiropterus</u>	Jul 76 Puerto Del Aire, Ver., Mex. 2380 M Bromeliads in oak-pine forest
001	12.8			<u>Chiropterotriton chiropterus</u>	Jul 76 16 Km N Perote, Ver., Mex 2220 M Under rock road cut
005	11.7	1.0	10.5-12.4	<u>Chiropterotriton chiropterus</u>	Jul 76 Las Vigas, Ver., Mex 2420 M Under logs, Oak-pine forest
015	09.7	2.1	07.8-16.2	<u>Chiropterotriton chiropterus</u>	Jul 76 Popocatepetl, Mex., Mex. 3300 M Under wood chips fir forest
006	11.5	2.3	08.5-14.2	<u>Chiropterotriton chiropterus</u>	Ibid 3230 M Under bark logs in pine fir forest
008	12.0	1.6	10.2-14.0	<u>Chiropterotriton chondrostega</u>	Jan 74 Rd to Tianguistengo, Hidalgo, Mex. 2100 M Under logs/bark pine forest
004	11.9	1.1	11.0-13.5	<u>Chiropterotriton dimidiata</u>	Sep 72 El Chico Natl Pk, Hidalgo, Mex 2850 M Under rocks/logs oak-fir forest
014	09.7	1.4	09.0-12.0	<u>Chiropterotriton dimidiata</u>	Jan 74 Ibid 2650 M
011	20.3	0.9	18.6-21.8	<u>Chiropterotriton lavae</u>	Jul 79 La Joya, Veracruz, Mex 2125 M In bromeliads on oak-pine ***
012	12.4	0.9	11.0-13.8	<u>Chiropterotriton multidentata</u>	Sept 72 Ibid 2850 M
004	08.7	1.3	08.0-10.6	<u>Chiropterotriton multidentata</u>	Jan 74 Ibid 2650 M
006	18.6	1.6	17.6-21.8	<u>Lineatriton lineola</u>	Jul 76 Cuautlapam, Ver., Mex 1100 M In dry stream bank in cafetal
002	18.3	0.1	18.2-18.3	<u>Parvimolge townsendi</u>	Jul 76 Ibid 1000 M
001	09.6			<u>Pseudoeurycea altamontana</u>	Jul 76 Zempoala, Morelos, Mex 3130 M Under log in fir forest
012	13.6	1.2	11.7-15.6	<u>Pseudoeurycea bellii</u>	Jul 76 Nevado de Toluca, Mex, Mex 3320 M Under rocks @ fir forest border
007	15.5	1.0	14.0-16.8	<u>Pseudoeurycea bellii</u>	Jul 76 Sierra de Cuatro Venados, Oaxaca, Mex 2760 M Under logs in pine woods
008	13.1	0.8	12.2-14.0	<u>Pseudoeurycea brunnata</u>	Jun 70 SM Trans, Gua. 2650 M Under logs wet forest
002	13.9	1.6	12.8-15.0	<u>Pseudoeurycea brunnata</u>	Ibid 2450 M
006	10.7	0.5	10.5-11.8	<u>Pseudoeurycea brunnata</u>	Dec-Jan 71-2 Ibid 2650 M
001	07.8			<u>Pseudoeurycea cephalica</u>	Jan 74 El Chico Natl Pk, Hidalgo, Mex 2650 M Under log moist oak-fir forest
013	12.9	0.7	11.8-13.7	<u>Pseudoeurycea cephalica</u>	Jul 76 N Perote, Veracruz, Mex 2220 M Under rocks in road cut
001	12.2			<u>Pseudoeurycea cochranae</u>	Jul 76 Sierra de Cuatro Venados, Oaxaca, Mex 2750 M Inside log open pine woods
002	14.5	0.4	14.2-14.7	<u>Pseudoeurycea cochranae</u>	Jul 76 NE Tejocote, Oaxaca, Mex 2350 M Under litter oak-pine forest
002	10.1	1.0	09.4-10.8	<u>Pseudoeurycea gadovii</u>	Jul 76 Xometla, Veracruz, Mex. 2610 M Under bark of stump, forest
				<u>Pseudoeurycea gadovii</u>	Mt Orizaba, Veracruz, Mex Swan (1952)
010	13.0	0.6	12.4-14.0	<u>Pseudoeurycea goebeli</u>	Jun 70 SM Trans, Gua. 2650 M Under logs in wet forest
001	11.2			<u>Pseudoeurycea goebeli</u>	Dec-Jan 71-2 Ibid 2350 M
005	10.1	2.1	08.0-12.4	<u>Pseudoeurycea goebeli</u>	Ibid 2700 M

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021	10.4	0.5	09.2-11.0	<u>Pseudoeurycea leprosa</u>	Jul 76 Zempoala, Morelos, Mex 3130 M Under logs, bark in fir forest
001	11.2			<u>Pseudoeurycea leprosa</u>	Jul 76 Xometla, Veracruz, Mex 2610 M Forest
004	13.8	1.0	12.4-14.5	<u>Pseudoeurycea leprosa</u>	Jul 76 Perote, Veracruz, Mex. 2220 M Under rocks in road cut
006	09.3	0.6	08.3-09.9	<u>Pseudoeurycea leprosa</u>	Jul 76 Popocatepetl, Mex, Mex 3300 M In wood chips fir forest
013	11.9	2.8	07.8-17.4	<u>Pseudoeurycea leprosa</u>	Jul 76 Ibid 3230 M
001	19.0			<u>Pseudoeurycea nigromaculata</u>	Sep 72 Cuautlapam, Veracruz, Mex 1625M In bromeliad wet forest
037	10.3	1.7	07.5-15.8	<u>Pseudoeurycea rex</u>	Aug-Sep 72 SM Trans, Gua 3550 M Under rocks, logs in open pine/grass
002	14.5	0.0	14.5-14.5	<u>Pseudoeurycea rex</u>	Aug 75 Cerro Mozotal, Chiapas, Mex 2850 M Under/in log, meadow in fir forest
015	05.4	1.3	03.0-08.3	<u>Pseudoeurycea rex</u>	Feb 74 SM Trans, Gua. 3475 M Under rocks, logs in open pine/grass
001	09.6			<u>Pseudoeurycea 'rex'-like</u>	Jun 70 Ibid 2850 M In log in wet forest
001	13.0			<u>Pseudoeurycea 'rex'-like</u>	Aug 72 Ibid
006	08.8	1.3	08.0-10.5	<u>Pseudoeurycea 'rex'-like</u>	Dec-Jan 71-2 Ibid 2750 M In bromeliad, under bark @ wet forest
005	12.1	1.0	10.6-13.2	<u>Pseudoeurycea robertsi</u>	Jul 76 Nevado de Toluca, Mex, Mex 3320 M Under rocks fir forest border
054	14.2	2.1	10.2-20.2	<u>Pseudoeurycea smithi</u>	Jul 76 Cerro San Felipe, Oaxaca, Mex 2960 M Under/in logs oak-pine forest
013	13.0	1.5	11.4-16.0	<u>Pseudoeurycea sp.</u>	Nov. Jul 76 Linguà de Vaca, Mex, Mex 2860 M Under bark or chips oak-fir forest
010	15.3	2.9	11.8-22.2	<u>Pseudoeurycea unguidentis</u>	Jul 76 Cerro San Felipe, Oaxaca, Mex 2960 M Under bark oak-pine forest
004	11.8	0.7	10.8-12.4	<u>Thorius dubitus</u>	Jul 76 Puerto del Aire, Veracruz, Mex 2380 M Bromeliads in oak-pine forest
019	16.4	3.0	10.4-21.2	<u>Thorius narisovalis</u>	Jul 76 Cerro San Felipe, Oaxaca, Mex 2840 M Under bark/logs in forest clearing
007	13.7	1.8	12.2-16.4	<u>Thorius narisovalis</u>	Jul 76 Ibid 2960 M Under leaves/bark in oak-pine forest
001	23.0			<u>Thorius pennatulus</u>	Sep 72 Cuautlapam, Veracruz, Mex 1250 M Under rock in cafetal
014	11.9	1.2	10.2-13.8	<u>Thorius maddougallii</u>	Jul 76 Llano de las Flores, Oaxaca, Mex 2830 M Under logs/bark in meadow
015	19.7	1.2	18.0-21.4	<u>Thorius sp. 'pulmonaris'</u>	Jul 76 Sola de Vega, Oaxaca, Mex 2150 M Under rocks/logs in pine-oak forest
033	11.7	1.0	10.1-14.0	<u>Thorius troglodytes</u>	Jul 76 Puerto del Aire, Veracruz, Mex 2380 M Under rocks/logs in oak-pine forest

8. NON-PLETHODONTIDS (AMBYSTOMATIDS):

16.0	<u>Ambystoma amblycephalum</u>	Nov	Iratzio, Mich, Mex 2130 M	Larvae in stream
26.0	<u>Ambystoma amblycephalum</u>	Aug	Ibid	
29.0	<u>Ambystoma amblycephalum</u>	Aug	9.8 MI W Morelia, Mich, Mex 1920 M	Adults in pond
14.6	<u>Ambystoma dumerilii</u>	Jan	Lago Patzcuaro, Mich, Mex 2010 M	Larvae in large lake
14.8	<u>Ambystoma dumerilii</u>	Jan	Ibid	
14.3	<u>Ambystoma dumerilii</u>	Jan	Ibid	

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21.0				<u>Ambystoma dumerilii</u>	Nov Ibid
25.0				<u>Ambystoma dumerilii</u>	Aug Ibid
23.0				<u>Ambystoma flavipiperatum</u>	Aug Guadelajara, Jal, Mex 1550 M Larvae in pond
18.0				<u>Ambystoma flavipiperatum</u>	Nov Ibid
18.0				<u>Ambystoma granulolum</u>	Nov 11.6 MI W Toluca, Mex, Mex 2500 M Larvae in pond
18.0				<u>Ambystoma granulolum</u>	Aug 9 MI W Toluca, Mex, Mex 2450 M Larvae in pond
16.0				<u>Ambystoma granulolum</u>	Jan Ibid Sexually mature and young larvae
28.0				<u>Ambystoma lermaensis</u>	Jun Almolya, Mex, Mex 2400 M Larvae in large pond
20.0				<u>Ambystoma mexicanum</u>	Nov Mixquic, DF, Mex 2200 M Larvae in canal
13.0				<u>Ambystoma ordinarium</u>	Jun W SJ De la Cumbre, Mich, Mex 2360 M Larvae in stream
18.0				<u>Ambystoma ordinarium</u>	Jun W SJ Lagunillas, Mich, Mex 2490 M Larvae in stream
17.0				<u>Ambystoma ordinarium</u>	Dec Ibid
14.0				<u>Ambystoma ordinarium</u>	Jan Ibid
17.0				<u>Ambystoma ordinarium</u>	Aug 10 MI SE San Gregorio, Mich, Mex 2100 M Larvae in stream
					11.8-12.4 <u>Ambystoma ordinarium</u> Jun 67 Puerto Garnica, Michoacan, Mex 2790 M Anderson and Worthington (1971)
22.0				<u>Ambystoma rosaceum</u>	Jun Colonia Garcia, Chih, Mex 2100 M Larvae in stream
20.5				<u>Ambystoma rosaceum</u>	Jun S Colonia Garcia, Chih, Mex 2100 M Larvae in pond
16.0				<u>Ambystoma rosaceum</u>	Jun Largo, Chih, Mex 2150 M Larvae in pond
30.0				<u>Ambystoma rosaceum</u>	Jun Yepomera, Chih, Mex 1900 M Larvae in stream
16.0				<u>Ambystoma rosaceum</u>	Jun El Verge, Chih, Mex 2450 M Larvae in stream
20.0				<u>Ambystoma rosaceum</u>	Jun El Salto, Durango, Mex 2600 M Larvae in stream
13.0				<u>Ambystoma rosaceum</u>	Nov La Ciudad, Durango, Mex 2500 Larvae in pond
26.0				<u>Ambystoma rosaceum</u>	Aug 14.3 MI W Tomachic, Chih, Mex 2200 M Larvae in ditch
15.0				<u>Ambystoma subsalsum</u>	Dec Alchichica, Puebla, Mex 2200 M Sex mat larvae in Caldera Lake
001 10.5				<u>Ambystoma tigrinum</u>	Nov 71 El Chico National Park, Hidalgo, Mexico 2925M Stream in montane meadow
15.0				<u>Ambystoma tigrinum</u>	Dec Tecuitlepa, Puebla, Mex. 2270 M Mature larvae in Caldera Lake
10.5				<u>Ambystoma tigrinum</u>	Dec Cofre de Perote, Puebla, Mex. 2800 M Larvae in stream
12.5				<u>Ambystoma tigrinum</u>	Aug Ibid Mature larvae
26.0				<u>Ambystoma tigrinum</u>	Aug 68 Mi S Galeana, Chih., Mex. 2160 M Larvae in pond
19.0				<u>Ambystoma tigrinum</u>	Aug 6 Mi NW Yepomera, Chih., Mex. 2000 M Larvae in pond



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26.0				<u>Ambystoma tigrinum</u>	Aug 33 Mi E Tomasachic, Chih., Mex 2100 M Larvae in pond
24.0				<u>Ambystoma tigrinum</u>	Aug 16 Mi E Tomachic, Chih., Mex 2200 M Larvae in pond
18.0				<u>Ambystoma tigrinum</u>	Aug San Martin, Mex, Mex. 1920 M Larvae in ditch
22.0				<u>Ambystoma tigrinum</u>	Aug 42.5 Mi E Valle de Bravo, Mex 2600 M Larvae in pond
22.0				<u>Ambystoma tigrinum</u>	Aug 1.5 Mi N Villa Hidalgo, SLP, Mex 1618M Adults in pond
23.0				<u>Ambystoma tigrinum</u>	Aug Vic SJ Iturbide, Guanajuato, Mex 2023M Adults & larvae in pond
19.0				<u>Ambystoma tigrinum</u>	Jun El Vergel, Chih., Mex 1900 M Sexually mature larvae in pond
19.0				<u>Ambystoma tigrinum</u>	Jun Hidalgo-Mexico border, Mex 2320 M Larvae in pond
17.0				<u>Ambystoma tigrinum</u>	Nov Mimbres, Durango, Mex 2250 M Larvae in pond
19.0				<u>Ambystoma tigrinum</u>	Nov Ibid 2350 M
17.0				<u>Ambystoma tigrinum</u>	Nov Vic El Salto, Durango, Mex 2530 M Larvae in pond
18.0				<u>Ambystoma tigrinum</u>	Nov Tapalpa, Jalisco, Mex 2110 M Adults in stream
19.0				<u>Ambystoma tigrinum</u>	Nov Patzcuaro, Mich, Mex 1970 M Larvae in cattle pond
15.0				<u>Ambystoma tigrinum</u>	Jan Ibid
14.0				<u>Ambystoma tigrinum</u>	Jan Nopaltepec, Mex, Mex 2360 M All stages in pond
18.0				<u>Ambystoma 'zacapu'</u>	Jun Lago de Zacapu, Mich, Mex 1930 M Larvae in large lake
20.5				<u>Ambystoma 'zacapu'</u>	Jun Ibid Stream draining lake
15.0				<u>Ambystoma 'zacapu'</u>	Jan Ibid
17.0				<u>Ambystoma 'zacapu'</u>	Nov Ibid
14.0				<u>Rhyacosiaredon altimirani</u>	Jun Chalma, Mex, Mex 2880 M Larvae and adults in stream
11.0				<u>Rhyacosiaredon rivularis</u>	Nov 7.7 Mi N Villa Victoria, Mex 2480 M Larvae in stream

## TEMPERATE ZONE SALAMANDERS

## A. PLETHODONTIDS:

18.0				<u>Aneides aeneus</u>	Jun NC 4100' Gordon and Smith (1949)
				<u>Aneides aeneus</u>	Jun NC Gordon (1952)
				<u>Aneides aeneus</u>	Jun NC Gordon (1952)
001 20.5				<u>Aneides ferreus</u>	Jun DR Brattstrom (1963)
003 17.0 0.2 16.8-17.1				<u>Aneides ferreus</u>	Jun DR Brattstrom (1963)
035 12.8 1.8				<u>Aneides flavipunctatus</u>	Nov CA Lynch (1974)

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
012	06.1	1.7		<u>Aneides flavipunctatus</u>	Jan CA Lynch (1974)
027	14.8	1.5		<u>Aneides flavipunctatus</u>	Nov CA Lynch (1974)
010	13.7	1.6		<u>Aneides flavipunctatus</u>	Nov CA Lynch (1974)
010	09.2	2.3		<u>Aneides flavipunctatus</u>	Jan CA Lynch (1974)
025	12.1	0.8		<u>Aneides flavipunctatus</u>	Nov CA Lynch (1974)
010	07.4	0.7		<u>Aneides flavipunctatus</u>	Jan CA Lynch (1974)
041	13.1	1.4		<u>Aneides flavipunctatus</u>	Nov-Dec CA Lynch (1974)
032	09.2	4.5		<u>Aneides flavipunctatus</u>	Jan-Feb CA Lynch (1974)
030	14.0	0.6		<u>Aneides flavipunctatus</u>	Mar-Apr CA Lynch (1974)
001	02.2			<u>Aneides flavipunctatus</u>	Dec CA Lynch (1974)
001	18.5			<u>Aneides flavipunctatus</u>	Jul CA Lynch (1974)
002	14.5	0.0	14.5-14.5	<u>Aneides hardii</u>	Aug NM Stebbins (1951)
010			02.8-15.0	<u>Aneides lugubris</u>	CA Stebbins (1951)/Brattstrom (1963)
013	14.4	1.4		<u>Aneides lugubris</u>	Nov CA Lynch (1974)
001	13.3			<u>Aneides lugubris</u>	Aug CA Stebbins (1954)
056	09.9	2.6	05.0-16.0	<u>Aneides lugubris</u>	Nov-Mar CA Rosenthal (1957)
037	10.9		02.0-17.0	<u>Aneides lugubris</u>	CA Rosenthal (1957)
067	10.2		08.0-19.0	<u>Aneides lugubris</u>	CA Rosenthal (1957)
002	03.4	1.8	02.1-04.6	<u>Aneides lugubris</u>	Nov CA Rosenthal (1957)
009	12.6	1.5		<u>Batrachoseps attenuatus</u>	Nov CA Lynch (1974)
005	15.8	1.1		<u>Batrachoseps attenuatus</u>	Nov CA Lynch (1974)
008	12.1	0.6		<u>Batrachoseps attenuatus</u>	Nov CA Lynch (1974)
021	02.3		02.2-04.0	<u>Batrachoseps attenuatus</u>	Jan CA 500' Hendrickson (1954)
001	13.3			<u>Batrachoseps attenuatus</u>	Aug CA Stebbins (1954)
014			10.2-10.5	<u>Batrachoseps attenuatus</u>	Dec CA Stebbins (1954)
026	08.8	1.1	06.8-09.5	<u>Batrachoseps nigriventris</u>	Feb CA Feder (Unpublished)
002	19.6	0.1	19.5-19.6	<u>Batrachoseps pacificus</u>	Sept CA Brattstrom (1963)
051	12.6	4.3	07.0-17.6	<u>Batrachoseps pacificus</u>	Feb CA Feder (Unpublished)
400			04.0-21.0	<u>Batrachoseps pacificus</u>	Throughout year CA Cunningham (1960)
003	08.0	0.0	08.0-08.0	<u>Batrachoseps wrighti</u>	Apr DR Stebbins (1951)

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
020	08.0	1.9	06.0-14.0	<u>Desmognathus fuscus</u>	Apr NY Feder (Unpublished)
016			01.0-22.0	<u>Desmognathus fuscus</u>	Apr-Nov OH Ashton(1975)
001	04.0			<u>Desmognathus fuscus</u>	Dec OH Ashton (1975)
003			01.0-04.5	<u>Desmognathus fuscus</u>	Winter OH Ashton (1975)
012			02.5-04.5	<u>Desmognathus fuscus</u>	Winter OH Ashton (1975)
003			02.0-04.0	<u>Desmognathus fuscus</u>	Winter OH Ashton (1975)
006			01.0-04.5	<u>Desmognathus fuscus</u>	Winter OH Ashton (1975)
003			02.5-06.0	<u>Desmognathus fuscus</u>	Winter OH Ashton (1975)
			06.0-07.0	<u>Desmognathus fuscus</u>	Feb OH Ashton (1975)
016	05.0	0.0	05.0-05.0	<u>Desmognathus fuscus</u>	Dec OH Ashton (1975)
003	04.0	0.0	04.0-04.0	<u>Desmognathus fuscus</u>	Dec OH Ashton (1975)
002	03.5	0.0	03.5-03.5	<u>Desmognathus fuscus</u>	Dec OH Ashton (1975)
002	12.7	0.7	12.2-13.2	<u>Desmognathus monticola</u>	Brattstrom (1963)
	09.0			<u>Desmognathus monticola</u>	Brattstrom (1963)
	11.0		10.0-12.0	<u>Desmognathus monticola</u>	Mar SC Shealy (1975)
	14.0		14.0-16.0	<u>Desmognathus monticola</u>	Apr SC Shealy (1975)
	14.0		13.0-16.0	<u>Desmognathus monticola</u>	May SC Shealy (1975)
	17.0		17.0-19.0	<u>Desmognathus monticola</u>	Jun SC Shealy (1975)
	19.0		19.0-20.0	<u>Desmognathus monticola</u>	Jul SC Shealy (1975)
	18.0		18.0-20.0	<u>Desmognathus monticola</u>	Aug SC Shealy (1975)
	15.0		14.0-16.0	<u>Desmognathus monticola</u>	Sep SC Shealy (1975)
	13.0		12.0-14.0	<u>Desmognathus monticola</u>	Oct SC Shealy (1975)
	12.0		12.0-13.0	<u>Desmognathus monticola</u>	Dec SC Shealy (1975)
	06.0		05.0-07.0	<u>Desmognathus monticola</u>	Feb SC Shealy (1975)
	03.0		02.0-06.0	<u>Desmognathus monticola</u>	Mar SC Shealy (1975)
031	17.8	1.2	16.2-20.1	<u>Desmognathus ochrophaeus</u>	Jul VA Bogert (1952)
031	15.5	1.0	13.2-17.3	<u>Desmognathus ochrophaeus</u>	Jul VA Bogert (1952)
			01.0-19.0	<u>Desmognathus ochrophaeus</u>	Throughout year Ohio Fitzpatrick (1973b)
	11.0		10.0-12.0	<u>Desmognathus ochrophaeus</u>	Mar SC Shealy (1975)
	14.0		14.0-16.0	<u>Desmognathus ochrophaeus</u>	Apr SC Shealy. (1975)

N	MEAN	SD	RANGE	SPECIES	DATE,	LOCALITY,	ELEVATION,	ETC.
14.0	13.0-16.0		<u>Desmognathus ochrophaeus</u>	May SC Shealy (1975)				
17.0	17.0-19.0		<u>Desmognathus ochrophaeus</u>	Jun SC Shealy (1975)				
19.0	19.0-20.0		<u>Desmognathus ochrophaeus</u>	Jul SC Shealy (1975)				
18.0	18.0-20.0		<u>Desmognathus ochrophaeus</u>	Aug SC Shealy (1975)				
15.0	14.0-16.0		<u>Desmognathus ochrophaeus</u>	Sep SC Shealy (1975)				
13.0	12.0-14.0		<u>Desmognathus ochrophaeus</u>	Oct SC Shealy (1975)				
04.0	03.0-06.0		<u>Desmognathus ochrophaeus</u>	Nov SC Shealy (1975)				
12.0	12.0-13.0		<u>Desmognathus ochrophaeus</u>	Dec SC Shealy (1975)				
06.0	05.0-07.0		<u>Desmognathus ochrophaeus</u>	Feb SC Shealy (1975)				
03.0	02.0-06.0		<u>Desmognathus ochrophaeus</u>	Mar SC Shealy (1975)				
004	18.5	17.0-19.8	<u>Desmognathus wrighti</u>	Jul VA Bogert (1952)				
003	15.7	15.5-15.8	<u>Desmognathus wrighti</u>	Jul VA Bogert (1952)				
14.6	12.4-19.5		<u>Ensatina eschschooltzii</u>	CA Brattstrom (1963)				
002	12.3	0.4	12.0-12.6	<u>Ensatina eschschooltzii</u>	OR? Brattstrom (1963)			
006	12.0	0.7	<u>Ensatina eschschooltzii</u>	Nov CA Lynch (1974)				
002	13.8	0.2	13.6-13.9	<u>Ensatina eschschooltzii</u>	Nov CA Hendrickson (1949)			
002	09.3	0.4	09.0-09.5	<u>Ensatina eschschooltzii</u>	CA Brattstrom (1963)			
001	20.0		<u>Ensatina eschschooltzii</u>	CA Stebbins (1954)				
001	01.0		<u>Ensatina eschschooltzii</u>	Feb CA Stebbins (1954)				
001	01.0		<u>Ensatina eschschooltzii</u>	Jan CA 1670 M Stebbins (1954)				
002	16.0	0.0	16.0-16.0	<u>Ensatina eschschooltzii</u>	Oct CA Stebbins (1954)			
002	12.8	0.7	12.3-13.3	<u>Ensatina eschschooltzii</u>	Aug CA Stebbins (1954)			
108	10.8		01.0-20.0	<u>Ensatina eschschooltzii</u>	CA Stebbins (1954)			
011	09.3		02.5-17.5	<u>Ensatina eschschooltzii</u>	Oct-Apr CA Stebbins (1954)			
046	08.8		02.5-17.0	<u>Ensatina eschschooltzii</u>	CA Stebbins (1954)			
004	13.8		11.5-15.7	<u>Ensatina eschschooltzii</u>	Mar Baja Norte, Mexico Mahrdt (1975)			
			08.0-16.0	<u>Eurycea b. bislineata</u>	Brattstrom (1963)			
039	08.4	3.0	04.5-14.4	<u>Eurycea bislineata</u>	Apr NY Feder (Unpublished)			
002	03.0	0.0	03.0-03.0	<u>Eurycea b. bislineata</u>	Feb Vernberg (1953)			
001	08.0		<u>Eurycea b. bislineata</u>	Feb Vernberg (1953)				



N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
			02.0-20.0	<u>Eurycea bislineata</u>	Throughout year Fitzpatrick (1973a)
001			01.0-04.5	<u>Eurycea bislineata</u>	Winter OH Ashton (1975)
003			02.5-04.5	<u>Eurycea bislineata</u>	Winter OH Ashton (1975)
003			02.0-04.0	<u>Eurycea bislineata</u>	Winter OH Ashton (1975)
001			02.5-06.0	<u>Eurycea bislineata</u>	Winter OH Ashton (1975)
001	05.0			<u>Eurycea bislineata</u>	Dec OH Ashton (1975)
002	03.0	0.0	03.5-03.5	<u>Eurycea bislineata</u>	Dec OH Ashton (1975)
001	18.2			<u>Eurycea b. wilderae</u>	Jul VA Bogert (1952)
004	15.9		15.5-16.6	<u>Eurycea b. wilderae</u>	Jul VA Bogert (1952)
003	17.5		15.0-22.0	<u>Eurycea longicauda</u>	Ark Spotilla (1972)
			08.0-19.0	<u>Eurycea longicauda</u>	VA Hutchison (1958)
011	15.6		13.5-22.2	<u>Eurycea lucifuga</u>	Ark Spotilla (1972)
			08.0-19.0	<u>Eurycea lucifuga</u>	VA Hutchison (1958)
			14.8-16.0	<u>Eurycea multiplicata griseogaster</u>	Throughout year Arkansas Ireland (1976)
			14.0-18.9	<u>Eurycea multiplicata griseogaster</u>	Throughout year Arkansas Ireland (1976)
			00.0-21.0	<u>Eurycea multiplicata griseogaster</u>	Throughout year Arkansas Ireland (1976)
002	26.3	0.1	26.2-26.3	<u>Eurycea [Manculus] quadridigitatus</u>	Texas Brattstrom (1963)
	12.0			<u>Gyrinophilus pallucus</u>	Dent and Kirby-Smith (1963)
017	08.1	2.8	05.0-16.0	<u>Gyrinophilus porphyriticus</u>	Apr NY Feder (Unpublished)
013	11.4	1.3	10.0-14.0	<u>Hydromantes brunus</u>	Mar 73 Hell Hollow, Mariposa co, CA Under rocks on hillside ***
024	05.7		-2.0-11.5	<u>Hydromantes platycephalus</u>	CA Brattstrom (1963)
001	07.1			<u>Hydromantes platycephalus</u>	CA 10800' Bogert (1952)
008	15.0	1.4	13.8-17.8	<u>Hydromantes platycephalus</u>	Jul 81 NE Face sierra buttes, Sierra Co, CA 2125 M Under rocks ***
001	16.0			<u>Hydromantes platycephalus</u>	Jul 81 Ibid 2200 M ***
	12.2			<u>Hydromantes shastae</u>	Jun CA Brattstrom (1963)
001	12.2			<u>Hydromantes shastae</u>	Mar CA Bury et al. (1969)
039	16.2		11.6-22.8	<u>Plethodon cadoensis</u>	Arkansas Spotilla (1972)
			09.5-17.5	<u>Plethodon cinereus</u>	May-Jun Mich Test and Bingham (1948)
			07.0-20.0	<u>Plethodon cinereus</u>	May-Jun Mich Test and Bingham (1948)
134	18.5	0.6	16.8-20.0	<u>Plethodon cinereus</u>	Jul VA Bogert (1952)

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
065	17.9	0.9	14.8-19.6	<u>Plethodon cinereus</u>	Jul VA Bogert (1952)
027	09.9	2.9	06.5-16.0	<u>Plethodon cinereus</u>	Apr NY Feder (Unpublished)
008	15.7	0.3	15.3-16.0	<u>Plethodon cinereus</u>	Aug NY Feder (Unpublished)
114	18.3	2.1	14.1-22.0	<u>Plethodon cinereus</u>	Jun-Jul NY Feder (Unpublished)
003	04.0	0.0	04.0-04.0	<u>Plethodon cinereus</u>	Feb Vernberg (1953)
002	03.0	0.0	03.0-03.0	<u>Plethodon cinereus</u>	Feb Vernberg (1953)
003	03.0	0.0	03.0-03.0	<u>Plethodon cinereus</u>	Feb Vernberg (1953)
007	08.0	0.0	08.0-08.0	<u>Plethodon cinereus</u>	Feb Vernberg (1953)
004	07.0	0.0	07.0-07.0	<u>Plethodon cinereus</u>	Feb Vernberg (1953)
001	05.0			<u>Plethodon cinereus</u>	Feb Vernberg (1953)
002	04.0	0.0	04.0-04.0	<u>Plethodon cinereus</u>	Feb Vernberg (1953)
135	13.3	9.7		<u>Plethodon cinereus</u>	Throughout year Taub (1961)
003	15.6		15.3-15.8	<u>Plethodon cinereus serratus</u>	Ark Spotila (1972)
008	12.0		11.4-13.0	<u>Plethodon dorsalis</u>	Ark Spotila (1972)
002	11.1	2.7	09.2-13.0	<u>Plethodon dunnii</u>	Brattstrom (1963)
017	10.8			<u>Plethodon dunnii</u>	OR Stebbins (1951)
002	15.1		14.4-15.8	<u>Plethodon glutinosus</u>	Ark Spotila (1972)
033	15.2		12.2-19.5	<u>Plethodon glutinosus</u>	Ark Spotila (1972)
001	14.0			<u>Plethodon glutinosus</u>	Brattstrom (1963)
039	18.3	0.6	16.8-19.5	<u>Plethodon glutinosus</u>	Jul VA Bogert (1952)
038	17.8	0.8	16.4-19.5	<u>Plethodon glutinosus</u>	Jul VA Bogert (1952)
013	18.4	0.6	17.0-19.2	<u>Plethodon huldae</u>	Jul VA Bogert (1952)
015	18.3	1.0	16.4-20.5	<u>Plethodon metcalfi</u>	Jul VA Bogert (1952)
021	15.7	0.9	13.5-17.4	<u>Plethodon metcalfi</u>	Jul VA Bogert (1952)
001	12.8			<u>Plethodon neomexicanus</u>	Aug NM Stebbins (1951)
009			11.0-13.0	<u>Plethodon neomexicanus</u>	Jun NM Reagan (1972)
101			10.5-13.0	<u>Plethodon neomexicanus</u>	Summer NM Reagan (1972)
041	17.0		15.2-21.4	<u>Plethodon ouachitae</u>	Arkansas Spotila (1972)
010	16.1		15.2-17.1	<u>Plethodon welleri</u>	Jul VA Bogert (1952)
028	06.0			<u>Plethodon vandykei</u>	Apr WA Stebbins (1951)

004	10.5	1.4	09.2-12.5	<u>Plethodon vehiculum</u>	Brattstrom (1963)
001	22.0			<u>Typhlomolge rathbuni</u>	Texas -45 M Brattstrom (1963)
B. NON-PLETHOONIDS:					
048	17.8		07.0-23.7	<u>Ambystoma cingulatum</u>	Nov-Dec SC-GA Anderson and Williamson (1976)
028	18.1		15.5-19.0	<u>Ambystoma cingulatum</u>	Nov SC-GA Night Anderson and Williamson (1976)
014	20.1		19.5-23.7	<u>Ambystoma cingulatum</u>	Nov SC-GA Day Anderson and Williamson (1976)
004	21.4	0.8	20.3-22.3	<u>Jeffersonianum</u>	Aug Minn. Brattstrom (1963)
001	19.0			<u>Jeffersonianum</u>	Jul Minn. Brattstrom (1963)
<01.0				<u>Jeffersonianum</u>	Mar NY Feder (Unpubl.)
			06.0-07.9	<u>Jeffersonianum</u>	Mar-Apr NJ Panek (1978)
054	12.9	5.5		<u>Jeffersonianum</u>	Throughout year Maryland Thompson et al. (1980)
			06.0-07.8	<u>Platineum</u>	Mar-Apr NJ Panek (1978)
005	21.0			<u>Macroductylum</u>	CA 1850 M Brode (1967)
223	14.2		06.0-22.0	<u>Macroductylum</u>	Throughout yr CA Terrestrial Anderson (1968)
006	09.8		09.0-10.4	<u>Macroductylum</u>	Throughout yr CA In pond Anderson (1968)
15.2			07.0-22.0	<u>Macroductylum</u>	Throughout yr CA Under cover Anderson (1968)
068	11.4		06.0-16.0	<u>Macroductylum</u>	Throughout yr CA Migrating Anderson (1968)
012	15.2			<u>Macroductylum</u>	Jan CA Anderson (1968)
019	08.9			<u>Macroductylum</u>	Jan CA Anderson (1968)
12.2			10.5-23.2	<u>Macroductylum</u>	CA Larvae Anderson (1968)
150	15.1		07.0-25.0	<u>Macroductylum</u>	CA Larvae Anderson (1968)
014	11.5		06.2-16.0	<u>Macroductylum</u>	Jan CA Adult terrestrial Anderson (1968)
012	11.7		09.0-13.2	<u>Macroductylum</u>	Feb CA Adult terrestrial Anderson (1968)
016	12.3		11.5-13.5	<u>Macroductylum</u>	Mar CA Adult terrestrial Anderson (1968)
010	11.5		10.0-12.5	<u>Macroductylum</u>	Apr CA Adult terrestrial Anderson (1968)
013	18.4		15.4-22.4	<u>Macroductylum</u>	Jun CA Adult terrestrial Anderson (1968)
010	17.7		16.0-19.4	<u>Macroductylum</u>	Aug CA Adult terrestrial Anderson (1968)
017	19.1		15.2-20.2	<u>Macroductylum</u>	Sep CA Adult terrestrial Anderson (1968)
015	16.3		14.4-18.0	<u>Macroductylum</u>	Sep CA Adult terrestrial Anderson (1968)
011	11.3		09.0-12.8	<u>Macroductylum</u>	Nov CA Adult terrestrial Anderson (1968)

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
019	12.9		09.0-14.8	<u>Ambystoma macrodactylum croceum</u>	Nov CA Adult terrestrial Anderson (1968)
027	08.6		04.0-16.0	<u>Ambystoma macrodactylum sigillatum</u>	Jun-Jul CA Adults Anderson (1968)
010			03.4-04.0	<u>Ambystoma macrodactylum sigillatum</u>	Jul CA Adults Anderson (1968)
			03.4-11.0	<u>Ambystoma macrodactylum sigillatum</u>	CA Eggs Anderson (1968)
055	07.4		04.0-14.2	<u>Ambystoma macrodactylum sigillatum</u>	Spring CA Larvae Anderson (1968)
010	23.1		22.0-24.5	<u>Ambystoma macrodactylum sigillatum</u>	Jul-Aug CA Larvae Anderson (1968)
			09.0-21.0	<u>Ambystoma macrodactylum sigillatum</u>	Summer CA Larvae Anderson (1968)
002	08.3	0.1	08.2-08.3	<u>Ambystoma maculatum</u>	Apr NY Brattstrom (1963)
	<01.0			<u>Ambystoma maculatum</u>	Mar NY Feder (Unpubl.)
			08.0-23.0	<u>Ambystoma maculatum</u>	(eggs) NY Pough (1976)
			17.0-32.0	<u>Ambystoma maculatum</u>	Jul NY Pough and Wilson (1970)
002	23.9	0.1	23.8-24.0	<u>Ambystoma opacum</u>	Alabama Brattstrom (1963)
001	16.0			<u>Ambystoma opacum</u>	May NY Brattstrom (1963)
			07.0-09.0	<u>Ambystoma opacum</u>	Mar NJ Anderson and Graham (1967)
			04.0-09.0	<u>Ambystoma talpoideum</u>	Jan LA Hardy and Raymond (1980)
			07.0-08.0	<u>Ambystoma talpoideum</u>	Feb LA Hardy and Raymond (1980)
			11.0-16.0	<u>Ambystoma talpoideum</u>	Dec LA Hardy and Raymond (1980)
			05.0-10.0	<u>Ambystoma talpoideum</u>	Jan LA Hardy and Raymond (1980)
			16.0-19.0	<u>Ambystoma talpoideum</u>	Feb-Mar LA Hardy and Raymond (1980)
001			02.5-04.5	<u>Ambystoma texanum</u>	Winter OH Ashton (1975)
007	22.6	1.8	21.2-26.5	<u>Ambystoma tigrinum</u>	(larvae) Aug CO Brattstrom (1963)
005	17.4	0.7	16.5-18.0	<u>Ambystoma tigrinum</u>	Aug Minn Brattstrom (1963)
002	22.0	1.4	20.0-24.0	<u>Ambystoma tigrinum</u>	Aug Minn Brattstrom (1963)
011			20.0-21.2	<u>Ambystoma tigrinum</u>	Aug Minn Brattstrom (1963)
001	20.6			<u>Ambystoma tigrinum</u>	Aug Minn Brattstrom (1963)
005	15.0			<u>Ambystoma tigrinum</u>	Aug Minn Brattstrom (1963)
051	02.0		02.0-07.0	<u>Ambystoma tigrinum</u>	McClure (1943)
			13.0-25.0	<u>Ambystoma tigrinum</u>	Aug CO Heath (1975)
			06.5-08.1	<u>Ambystoma tigrinum</u>	Jan NM Whitford and Massey (1970)
			06.2-12.8	<u>Ambystoma tigrinum</u>	Mar NM Whitford and Massey (1970)



003	24.0		12.0-17.5	<u>Ambystoma tigrinum</u>	Apr NM Whitford and Massey (1970)
			15.0-24.0	<u>Ambystoma tigrinum</u>	Jun NM Whitford and Massey (1975)
			16.8-17.4	<u>Ambystoma tigrinum mavortium</u>	Feb OK Black (1969)
			24.0-24.0	<u>Amphiuma means</u>	Sept Florida Brattstrom (1963)
			09.8-22.5	<u>Cryptobranchus alleganiensis</u>	Throughout year MO Nickerson and Mays (1973)
			26.7-28.0	<u>Cryptobranchus alleganiensis</u>	Aug-Sep PA Hillis and Bellis (1971)
007	13.6	1.8	12.0-16.2	<u>Dicamptodon ensatus</u>	(larvae) Jun-Jul OR Brattstrom (1963)
004	12.1	1.8	10.0-13.7	<u>Dicamptodon ensatus</u>	Jun-Jul OR Brattstrom (1963)
001	10.0			<u>Dicamptodon ensatus</u>	Jun OR Brattstrom (1963)
001	11.2			<u>Dicamptodon ensatus</u>	Jun OR Brattstrom (1963)
001	13.5			<u>Dicamptodon ensatus</u>	Sep ID Nussbaum (1969b)
	10.3			<u>Dicamptodon ensatus</u>	May OR Nussbaum (1969b)
	09.2			<u>Dicamptodon ensatus</u>	May OR Nussbaum (1969b)
002	27.3		26.7-27.8	<u>Notophthalmus viridescens</u>	Texas Brattstrom (1963)
009	09.5		07.8-13.5	<u>Notophthalmus viridescens</u>	NY Brattstrom (1963)
			15.2-28.4	<u>Notophthalmus viridescens</u>	July Vermont Pough (1973)
004	24.0		24.0-24.0	<u>Pseudobranchus striatus</u>	Sept Florida Brattstrom (1963)
			08.0-26.0	<u>Pseudobranchus striatus</u>	Throughout year Fla Ultsch (1973)
002	09.3	0.1	09.2-09.3	<u>Rhyacotriton olympicus</u>	Apr CA Stebbins (1951)
002	08.5	0.1	08.4-08.5	<u>Rhyacotriton olympicus</u>	Mar CA Stebbins (1951)
002	09.5	0.1	09.4-09.6	<u>Rhyacotriton olympicus</u>	Apr CA Stebbins (1951)
003	07.6	0.1	07.5-07.6	<u>Rhyacotriton olympicus</u>	Nov CA Stebbins (1951)
002	08.9	0.1	08.8-08.9	<u>Rhyacotriton olympicus</u>	Mar CA Stebbins (1951)
004	07.4	0.1	07.3-07.6	<u>Rhyacotriton olympicus</u>	Nov CA Stebbins (1951)
004	07.9	0.1	07.8-08.0	<u>Rhyacotriton olympicus</u>	Apr OR Stebbins (1951)
001	06.8			<u>Rhyacotriton olympicus</u>	Apr WA Stebbins (1951)
004	05.9	0.1	05.8-06.0	<u>Rhyacotriton olympicus</u>	Apr WA Stebbins (1951)
001	07.6			<u>Rhyacotriton olympicus</u>	Apr WA Stebbins (1951)
	08.3			<u>Rhyacotriton olympicus</u>	Dec OR Nussbaum (1969a)
006	14.8		12.5-18.4	<u>Taricha granulosa</u>	Brattstrom (1963)

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
040	11.0			<u>Taricha granulosa</u>	Oct OR Coates et al. (1970)
040	04.5			<u>Taricha granulosa</u>	Nov OR Coates et al. (1970)
			09.0-26.0	<u>Taricha rivularis</u>	CA Licht and Brown (1967)
			22.0-23.8	<u>Taricha torosa</u>	Jun CA Brattstrom and Warren (1953)
001	13.3			<u>Taricha torosa</u>	Aug CA Stebbins (1954)
008	17.2	1.0	15.8-18.3	<u>Taricha torosa</u>	Jun CA Stebbins (1951)
034	14.5	0.6	13.3-16.0	<u>Salamandra salamandra</u>	Aug Oviedo Prov., Spain Busack (1978)
			08.0-26.0	<u>Siren intermedia</u>	Throughout year Fla Ultsch (1973)
			08.0-26.0	<u>Siren lacertina</u>	Throughout year Fla Ultsch (1973)

Table 2: Annual variation in the body temperatures of salamanders. Because body temperature varies with elevation, we limited annual records to those tropical species for which summer and winter series were available at the same or similar elevations.

Minimum	Maximum	Range	Species	Minimum reference	Maximum reference
<b>Tropical plethodontids:</b>					
12.0	19.4	07.4	<u>Bolitoglossa franklini</u> (ca. 2000 M)		
09.0	18.0	09.0	<u>Bolitoglossa franklini</u> (ca. 2350 M)		
17.8	24.0	06.2	<u>Bolitoglossa occidentalis</u>		
10.5	16.0	05.5	<u>Bolitoglossa resplendens</u>		
07.8	18.2	10.4	<u>Bolitoglossa rostrata</u> (SM Transect)		
05.5	14.4	08.9	<u>Bolitoglossa rostrata</u> (Xantehuitz)		
10.6	15.5	04.9	<u>Chiropetrotriton bromeliacea</u>		
09.0	13.5	04.5	<u>Chiropetrotriton dimidiata</u>		
08.0	13.8	05.8	<u>Chiropetrotriton multidentatus</u>		
03.0	15.8	12.8	<u>Pseudoeurycea rex</u>		
08.0	13.0	05.0	<u>Pseudoeurycea 'rex-like'</u>		
<b>Tropical non-plethodontids:</b>					
16.0	29.0	13.0	<u>Ambystoma amblycephalum</u> (1920-2130 M)		
14.3	25.0	10.7	<u>Ambystoma dumerilii</u>		
18.0	23.0	05.0	<u>Ambystoma flavipiperatum</u>		
16.0	18.0	02.0	<u>Ambystoma granulatum</u>		
13.0	18.0	05.0	<u>Ambystoma ordinarium</u> (2360-2490 M)		
15.0	26.0	11.0	<u>Ambystoma tigrinum</u> (1970-2100 M)		
14.0	26.0	12.0	<u>Ambystoma tigrinum</u> (2250-2360 M)		
13.0	20.0	07.0	<u>Ambystoma rosaceum</u> (2450-2600 M)		
15.0	20.5	05.5	<u>Ambystoma 'zacapu'</u>		
<b>Temperate plethodontids:</b>					
02.2	18.5	16.3	<u>Aneides flavipunctatus</u>	Lynch (1974)	Same as minimum
02.1	19.0	16.9	<u>Aneides lugubris</u>	Rosenthal (1957)	Same as minimum
02.2	15.8	13.6	<u>Batrachoseps attenuatus</u>	Hendrickson (1954)	Lynch (1974)
04.0	21.0	17.0	<u>Batrachoseps pacificus</u>	Cunningham (1960)	Same as minimum
01.0	22.0	21.0	<u>Desmognathus fuscus</u>	Ashton (1975)	Same as minimum
02.0	20.0	18.0	<u>Desmognathus monticola</u>	Shealy (1975)	Same as minimum
01.0	19.0	18.0	<u>Desmognathus ochrophaeus</u>	Fitzpatrick (1973b)	Same as minimum
01.0	20.0	19.0	<u>Ensatina eschscholtzii</u>	Stebbins (1954)	Same as minimum
01.0	20.0	19.0	<u>Eurycea bislineata</u>	Ashton (1975)	Fitzpatrick (1973a)
08.0	22.0	14.0	<u>Eurycea longicauda</u>	Hutchison (1958)	Spotila (1972)
08.0	22.2	14.2	<u>Eurycea lucifuga</u>	Hutchison (1958)	Spotila (1972)
00.0	21.0	21.0	<u>Eurycea multiplicata griseogaster</u>	Ireland (1976)	Same as minimum
14.9	16.0	01.2	<u>Eurycea multiplicata griseogaster</u>	Ireland (1976)	Same as minimum
-2.0	11.5	13.5	<u>Hydromantes platycephalus</u>	Brattstrom (1963)	Same as minimum
03.0	22.0	19.0	<u>Plethodon cinereus</u>	Vernberg (1953)	Feder (Unpublished)
<b>Temperate non-plethodontids:</b>					
01.0	22.3	21.3	<u>Ambystom jeffersonianum</u>	Feder (Unpublished)	Brattstrom (1963)
06.2	25.0	18.8	<u>Ambystoma macrodactylum croceum</u>	Anderson (1968)	Same as minimum
03.4	24.5	21.1	<u>Ambystoma macrodactylum sigillatum</u>	Anderson (1968)	Same as minimum
01.0	32.0	31.0	<u>Ambystoma maculatum</u>	Feder (Unpublished)	Pough and Wilson (1970)
06.2	24.0	17.8	<u>Ambystoma tigrinum</u>	Whitford and Massey (1970)	Same as minimum
09.8	28.0	18.2	<u>Cryptobranchus alleganiensis</u>	Nickerson and Mays (1973)	Hillis and Bellis (1971)
09.2	16.2	07.0	<u>Dicamptodon ensatus</u>	Nussbaum (1969b)	Brattstrom (1963)
07.8	28.4	20.6	<u>Notophthalmus viridescens</u>	Brattstrom (1963)	Pough (1973)
08.0	26.0	18.0	<u>Pseudobranchius striatus</u>	Ultsch (1973)	Same as minimum
05.8	09.6	03.8	<u>Rhyacotriton olympicus</u>	Stebbins (1951)	Same as minimum
04.5	18.4	13.9	<u>Taricha granulosa</u>	Coates et al. (1970)	Brattstrom (1963)
08.0	26.0	18.0	<u>Siren intermedia</u>	Ultsch (1973)	Same as minimum
08.0	26.0	18.0	<u>Siren lacertina</u>	Ultsch (1973)	Same as minimum

Table 3: Minimum and maximum records for salamander species. '0' refers to record for summer; '1' refers to record for winter.

Minimum	Season	Maximum	Season	Species
Tropical plethodontids:				
11.8	0	11.8	0	<u>Bolitoglossa compacta</u>
20.0	0	22.4	0	<u>Bolitoglossa dunni</u>
11.6	1	19.4	1	<u>Bolitoglossa engelhardti</u>
09.0	1	19.4	1	<u>Bolitoglossa franklini</u>
12.0	0	14.4	0	<u>Bolitoglossa hartwegi</u>
20.5	0	20.5	0	<u>Bolitoglossa mexicanum</u>
10.5	0	16.0	0	<u>Bolitoglossa morio</u>
16.5	1	16.5	1	<u>Bolitoglossa nigroflavescens</u>
17.8	1	30.0	0	<u>Bolitoglossa occidentalis</u>
08.0	0	16.0	0	<u>Bolitoglossa resplendens</u>
05.5	1	18.2	0	<u>Bolitoglossa rostrata</u>
17.0	1	22.0	0	<u>Bolitoglossa rufescens</u>
02.8	1	23.8	0	<u>Bolitoglossa subpalmata</u>
09.0	1	16.6	0	<u>Chiropetrotriton bromeliacea</u>
07.8	0	16.2	0	<u>Chiropetrotriton chiropetrus</u>
10.2	1	14.0	1	<u>Chiropetrotriton chondrostega</u>
09.0	1	13.5	0	<u>Chiropetrotriton dimidiata</u>
08.0	1	13.8	0	<u>Chiropetrotriton multidentata</u>
17.6	0	21.8	0	<u>Lineatriton lineola</u>
18.2	0	18.3	0	<u>Parvimolge townsendi</u>
09.6	0	09.6	0	<u>Pseudoeurycea altamontana</u>
11.7	0	16.9	0	<u>Pseudoeurycea bellii</u>
10.5	1	15.0	0	<u>Pseudoeurycea brunnata</u>
12.2	0	14.7	0	<u>Pseudoeurycea cochranae</u>
06.0	0	10.8	0	<u>Pseudoeurycea gadovii</u>
08.0	1	14.0	0	<u>Pseudoeurycea goebeli</u>
07.8	0	17.4	0	<u>Pseudoeurycea leprosa</u>
19.0	0	19.0	0	<u>Pseudoeurycea nigromaculata</u>
03.0	1	15.8	0	<u>Pseudoeurycea rex</u>
08.0	1	13.0	0	<u>Pseudoeurycea 'rex-like'</u>
10.6	0	16.0	0	<u>Pseudoeurycea robertsi</u>
10.2	0	20.2	0	<u>Pseudoeurycea smithi</u>
11.8	0	22.2	0	<u>Pseudoeurycea unguidentis</u>
10.8	0	12.4	0	<u>Thorius dubitus</u>
10.4	0	21.2	0	<u>Thorius narisovalis</u>
23.0	0	23.0	0	<u>Thorius pennatulus</u>
18.0	0	21.4	0	<u>Thorius pulmonaris</u>
10.2	0	13.8	0	<u>Thorius macdougalli</u>
10.1	0	14.0	0	<u>Thorius troglodytes</u>
Tropical ambystomatids:				
16.0	1	29.0	0	<u>Ambystoma amblycephalum</u>
14.3	1	25.0	0	<u>Ambystoma dumerilii</u>
18.0	1	23.0	0	<u>Ambystoma flavipiperatum</u>
16.0	1	18.0	0	<u>Ambystoma granulatum</u>
28.0	0	28.0	0	<u>Ambystoma lermaensis</u>
20.0	1	20.0	1	<u>Ambystoma mexicanum</u>
11.8	0	18.0	0	<u>Ambystoma ordinarium</u>
13.0	1	30.0	0	<u>Ambystoma rosaceum</u>
15.0	1	15.0	1	<u>Ambystoma subsalsum</u>



10.5	1	26.0	0	<u>Ambystoma tigrinum</u>
15.0	1	20.5	0	<u>Ambystoma 'zacapu'</u>
14.0	0	14.0	0	<u>Rhyacosiredon altimirani</u>
11.0	1	11.0	1	<u>Rhyacosiredon rivularis</u>

## Temperate plethodontids:

11.1	0	22.0	0	<u>Aneides aeneus</u>
16.8	0	20.5	0	<u>Aneides ferreus</u>
02.2	1	18.5	0	<u>Aneides flavipunctatus</u>
14.5	0	14.5	0	<u>Aneides hardii</u>
02.0	1	19.0	0	<u>Aneides lugubris</u>
02.2	1	15.8	1	<u>Batrachoseps attenuatus</u>
04.0	1	22.0	0	<u>Batrachoseps pacificus</u>
06.8	1	07.5	1	<u>Batrachoseps nigriventris</u>
08.0	0	08.0	0	<u>Batrachoseps wrighti</u>
01.0	1	22.0	0	<u>Desmognathus fuscus</u>
02.0	1	20.0	0	<u>Desmognathus monticola</u>
02.0	1	20.0	0	<u>Desmognathus ochrophaeus</u>
01.0	1	20.0	0	<u>Ensatina eschscholtzii</u>
01.0	1	20.0	0	<u>Eurycea bislineata</u>
08.0	1	22.0	0	<u>Eurycea longicauda</u>
08.0	1	22.0	0	<u>Eurycea lucifuga</u>
00.0	1	21.0	0	<u>Eurycea multiplicata</u>
26.2	0	26.3	0	<u>Eurycea quadridigitatus</u>
12.0	0	12.0	0	<u>Gyrinophilus palleucus</u>
05.0	0	16.0	0	<u>Gyrinophilus porphyriticus</u>
12.2	1	12.2	0	<u>Hydromantes shastae</u>
-2.0	1	11.5	0	<u>Hydromantes platycephalus</u>
11.6	0	22.8	0	<u>Plethodon caddoensis</u>
03.0	1	22.0	0	<u>Plethodon cinereus</u>
11.4	0	13.0	0	<u>Plethodon dorsalis</u>
09.2	0	13.0	0	<u>Plethodon dunni</u>
12.2	0	19.5	0	<u>Plethodon glutinosus</u>
17.0	0	19.2	0	<u>Plethodon huldae</u>
13.5	0	20.5	0	<u>Plethodon metcalfi</u>
10.5	0	13.0	0	<u>Plethodon neomexicanus</u>
15.2	0	21.4	0	<u>Plethodon ouchitae</u>
15.2	0	17.1	0	<u>Plethodon welleri</u>
06.0	0	06.0	0	<u>Plethodon vandykei</u>
09.2	0	12.5	0	<u>Plethodon vehiculum</u>
22.0	0	22.0	0	<u>Typhlomolge rathbuni</u>

## Temperate non-plethodontids:

07.0	1	23.7	1	<u>Ambystoma cingulatum</u>
01.0	1	22.3	0	<u>Ambystoma jeffersonianum</u>
06.0	1	07.8	1	<u>Ambystoma platineum</u>
04.0	1	19.0	1	<u>Ambystoma talpoideum</u>
03.4	1	25.0	0	<u>Ambystoma macrodactylum</u>
01.0	1	32.0	0	<u>Ambystoma maculatum</u>
07.0	1	24.0	0	<u>Ambystoma opacum</u>
02.5	1	04.5	1	<u>Ambystoma texanum</u>
02.0	1	26.5	0	<u>Ambystoma tigrinum</u>
24.0	0	24.0	0	<u>Amphiuma means</u>
09.8	1	28.0	0	<u>Cryptobranchus alleganiensis</u>
09.2	0	16.2	0	<u>Dicamptodon ensatus</u>
07.8	1	27.8	0	<u>Notophthalmus viridescens</u>

08.0	1	26.0	0	<u>Pseudobranchus striatus</u>
05.8	0	09.6	0	<u>Rhyacotriton olympicus</u>
13.3	0	16.0	0	<u>Salamandra salamandra</u>
08.0	1	26.0	0	<u>Siren intermedia</u>
08.0	1	26.0	0	<u>Siren lacertina</u>
04.5	1	18.4	0	<u>Taricha granulosa</u>
09.0	1	26.0	0	<u>Taricha rivularis</u>
13.3	0	18.3	0	<u>Taricha torosa</u>

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