

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 NEOTROPICAL 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. PLETHODONTIDS

001	15.0		Bolitoglossa adspersa	Bogota, Colombia 2650 M	Stebbins and Hendrickson (1959)
001	11.8	11.8-11.8	<u>Bolitoglossa 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 Dunnii</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 Engelhardti</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 Engelhardti</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 franklini</u>	June 70 SM transect 2350 M elev Wet forest bromeliads
003	16.6	2.0	14.4-18.4	<u>Bolitoglossa franklini</u>	Aug-Sept 72 Ibid. 2100 M
001	15.2		<u>Bolitoglossa franklini</u>	Ibid.	2450 M
004	12.6	0.3	12.3-12.9	<u>Bolitoglossa franklini</u>	Aug 75 Ibid 2125 M
004	10.5	1.0	9.0-11.0	<u>Bolitoglossa franklini</u>	Nov 74 2450 M Ibid
005	17.1	3.1	12.0-19.4	<u>Bolitoglossa franklini</u>	Dec-Ja 71-71 1950 M Ibid
002	13.8	2.0	12.4-15.2	<u>Bolitoglossa franklini</u>	Ibid 2350 M
003	12.8	1.4	12.0-14.4	<u>Bolitoglossa hartwegi</u>	Aug 75 Xantehuitz, Chis. Mex 2750 M Under logs clearing in wet forest
001	20.5		<u>Bolitoglossa 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 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 morio</u>	Dec-Ja 70 2850 M Ibid
001	16.5		<u>Bolitoglossa 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 occidentalis</u>	SM Trans 1100 M In banana plants
012	22.7	0.8	21.4-24.0	<u>Bolitoglossa occidentalis</u>	Aug 75 Ibid
009	27.4	1.2	24.5-28.4	<u>Bolitoglossa occidentalis</u>	Aug 75 Rd to Nueva Altemani, Chis. Mex. 600 M Banana plants
002	29.9	0.1	29.8-30.0	<u>Bolitoglossa occidentalis</u>	Aug 75 Cruz Blanca, Chis., Mex. 500 M In banana plants
012	20.9	1.1	19.0-22.4	<u>Bolitoglossa 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 occidentalis</u>	Feb 74 Ibid

## DATE, LOCALITY, ELEVATION, ETC.

N	MEAN	SD	RANGE	SPECIES	
002	24.3	24.0-24.6	Bolitoglossa platydactyla	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 1og 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 1og & 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 Della 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)
				<u>Bolitoglossa subpalmata</u>	Sep Cerro de la Muerte, Costa Rica 2926M Vial (1968)
				<u>Bolitoglossa subpalmata</u>	07.5-12.0 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 bromeliatum</u>	June 70 SM Transect, Gua 2400 M Bromeliad in wet forest
016	12.5	0.3	12.2-12.8	<u>Chiropterotriton bromeliatum</u>	Ibid 2650 M
002	14.8	1.1	14.0-15.5	<u>Chiropterotriton bromeliatum</u>	Aug-Sep 72 Ibid 2450 M
009	13.1	0.5	12.5-14.0	<u>Chiropterotriton bromeliatum</u>	Aug 75 2125 M Ibid
006	09.4	0.3	09.0-09.8	<u>Chiropterotriton bromeliatum</u>	Nov 74 Ibid 2450 M
015	13.7	1.4	12.4-15.2	<u>Chiropterotriton bromeliatum</u>	Dac-Ja 71-2 2350 Ibid
008	10.6	0.0	10.6-10.6	<u>Chiropterotriton bromeliatum</u>	Ibid 2600 M

N	MEAN	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
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 Tlanguistengo, 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 altamazonica</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 gadovi</u>	Jul 76 Xometla, Veracruz, Mex. 2610 M Under bark of stump, forest
010	13.0	0.6 12.4-14.0	<u>Pseudoeurycea goebelli</u>	Jun 70 SM Trans. Gua. 2650 M Under logs in wet forest
001	11.2		<u>Pseudoeurycea goebelli</u>	Dec-Ja 71-2 Ibid 2350 M
005	10.1	2.1 08.0-12.4	<u>Pseudoeurycea goebelli</u>	Ibid 2700 M

## DATE, LOCALITY, ELEVATION, ETC.

N MEAN SD RANGE SPECIES DATE, LOCALITY, ELEVATION, ETC.  
 021 10.4 0.5 09.2-11.0 Pseudoeurycea leprosa Jul 76 Zempoala, Morelos, Mex. 3130 M Under logs, bark in fir forest  
 001 11.2

Pseudoeurycea leprosa Jul 76 Xometla, Veracruz, Mex. 2610 M Forest

004 13.8 1.0 12.4-14.5 Pseudoeurycea leprosa Jul 76 Parote, Veracruz, Mex. 2220 M Under rocks in road cut

006 09.3 0.6 08.3-09.9 Pseudoeurycea leprosa Jul 76 Popocatepetl, Mex. Mex. 3300 M In wood chips fir forest

013 11.9 2.8 07.8-17.4 Pseudoeurycea leprosa Jul 76 Ibid 3230 M

Pseudoeurycea nigromaculata Sep 72 Cuautlapam, Veracruz, Mex. 1625M In bromeliad wet forest

037 10.3 1.7 07.5-15.8 Pseudoeurycea rex Aug-Sep 72 SM Trans, Gua. 3550 M Under rocks, logs in open pine/grass

002 14.5 0.0 14.5-14.5 Pseudoeurycea rex Aug 75 Cerro Mozotal, Chiapas, Mex. 2850 M Under/in log, meadow in fir forest

015 05.4 1.3 03.0-08.3 Pseudoeurycea rex Feb 74 SM Trans, Gua. 3475 M Under rocks, logs in open pine/grass

001 09.6 Pseudoeurycea 'rex'-like Jun 70 Ibid 2850 M In log in wet forest

001 13.0 Pseudoeurycea 'rex'-like Aug 72 Ibid

006 08.8 1.3 08.0-10.5 Pseudoeurycea 'rex'-like Dec-Jan 71-2 Ibid 2750 M In bromeliad, under bark @ wet forest

005 12.1 1.0 10.6-13.2 Pseudoeurycea robertsi Jul 76 Nevado de Toluca, Mex. Mex. 3320 M Under rocks fir forest border

054 14.2 2.1 10.2-20.2 Pseudoeurycea smithi Jul 76 Cerro San Felipe, Oaxaca, Mex. 2960 M Under/in logs oak-pine forest

013 13.0 1.5 11.4-16.0 Pseudoeurycea sp. Nov. Jul 76 Llingua de Vaca, Mex. Mex. 2860 M Under bark or chips oak-fir forest

010 15.3 2.9 11.8-22.2 Pseudoeurycea unguidentis Jul 76 Cerro San Felipe, Oaxaca, Mex. 2960 M Under bark oak-pine forest

004 11.8 0.7 10.8-12.4 Thorius dubitus Jul 76 Puerto del Aire, Veracruz, Mex. 2380 M Bromeliads in oak-pine forest

019 16.4 3.0 10.4-21.2 Thorius narisovalis Jul 76 Cerro San Felipe, Oaxaca, Mex. 2840 M Under bark/logs in forest clearing

007 13.7 1.8 12.2-16.4 Thorius narisovalis Jul 76 Ibid 2960 M Under leaves/bark in oak-pine forest  
 001 23.0 Thorius pennatus Sep 72 Cuautlapam, Veracruz, Mex. 1250 M Under rock in cañada

014 11.9 1.2 10.2-13.8 Thorius macdougalii Jul 76 Llano de las Flores, Oaxaca, Mex. 2830 M Under logs/bank in meadow

015 19.7 1.2 18.0-21.4 Thorius sp. 'Pulmonaris' 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 Thorius troglodytes Jul 76 Puerto del Aire, Veracruz, Mex. 2380 M Under rocks/logs in oak-pine forest

## B. NON-PLETHODONTIDS (AMBYSTOMATIDS):

16.0 Ambystoma amblycephalum Nov Iratzio, Mich., Mex. 2130 M Larvae in stream

26.0 Ambystoma amblycephalum Aug Ibid

29.0 Ambystoma amblycephalum Aug 9.8 MI W Morelia, Mich., Mex. 1920 M Adults in pond

14.6 Ambystoma dumerilii Jan Lago Patzcuaro, Mich., Mex. 2010 M Larvae in large lake

14.8 Ambystoma dumerilii Jan Ibid

14.3 Ambystoma dumerilii Jan Ibid

N	MEAN	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
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 granulosum</u>	Nov 11.6 Mi W Toluca, Mex. Mex 2500 M Larvae in pond
18.0			<u>Ambystoma granulosum</u>	Aug 9 Mi W Toluca, Mex. Mex 2450 M Larvae in pond
16.0			<u>Ambystoma granulosum</u>	Jan Ibid Sexually mature and young larvae
28.0			<u>Ambystoma tormensis</u>	Jun Almoloya, 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
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 Vergel, 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	10.5-10.5		<u>Ambystoma tigrinum</u>	Nov 71 El Chico National Park, Hidalgo, Mexico 2925M Stream in montane meadow
15.0			<u>Ambystoma tigrinum</u>	Dec Tecuitlapa, 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 6 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

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
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 Tepalcatepec, 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 Nopaltepéc, 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>Rhyacosiredon altimirani</u>	Jun Chalma, Mex, Mex 2880 M Larvae and adults in stream
11.0				<u>Rhyacosiredon rivularis</u>	Nov 7.7 Mi N Villa Victoria, Mex 2480 M Larvae in stream

## TEMPERATE ZONE SALAMANDERS

## A. PLETHODONTIDS:

- 18.0                    Aneides aeneus Jun NC 4100' Gordon and Smith (1949)
- 11.1-22.2            Aneides aeneus Jun NC Gordon (1952)
- 12.2-20.0            Aneides aeneus Jun NC Gordon (1952)
- 001 20.5            Aneides ferreus Jun OR Brattstrom (1963)
- 003 17.0 0.2 16.8-17.1    Aneides ferreus Jun OR Brattstrom (1963)
- 035 12.8 1.8            Aneides flavipunctatus 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 OR 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	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	0	<u>Desmognathus fuscus</u>	Winter OH Ashton	(1975)	
012	02.5-04.5	0	<u>Desmognathus fuscus</u>	Winter OH Ashton	(1975)	
003	02.0-04.0	0	<u>Desmognathus fuscus</u>	Winter OH Ashton	(1975)	
006	01.0-04.5	0	<u>Desmognathus fuscus</u>	Winter OH Ashton	(1975)	
003	02.5-06.0	0	<u>Desmognathus fuscus</u>	Winter OH Ashton	(1975)	
			<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	0	<u>Desmognathus monticola</u>	Mar SC Shealy	(1975)	
14.0	14.0-16.0	0	<u>Desmognathus monticola</u>	Apr SC Shealy	(1975)	
14.0	13.0-16.0	0	<u>Desmognathus monticola</u>	May SC Shealy	(1975)	
17.0	17.0-19.0	0	<u>Desmognathus monticola</u>	Jun SC Shealy	(1975)	
19.0	19.0-20.0	0	<u>Desmognathus monticola</u>	Jul SC Shealy	(1975)	
18.0	18.0-20.0	0	<u>Desmognathus monticola</u>	Aug SC Shealy	(1975)	
15.0	14.0-16.0	0	<u>Desmognathus monticola</u>	Sep SC Shealy	(1975)	
13.0	12.0-14.0	0	<u>Desmognathus monticola</u>	Oct SC Shealy	(1975)	
12.0	12.0-13.0	0	<u>Desmognathus monticola</u>	Dec SC Shealy	(1975)	
06.0	05.0-07.0	0	<u>Desmognathus monticola</u>	Feb SC Shealy	(1975)	
03.0	02.0-06.0	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)
			<u>Desmognathus ochrophaeus</u>	Throughout year	Ohio Fitzpatrick	(1973b)
11.0	10.0-12.0	0	<u>Desmognathus ochrophaeus</u>	Mar SC Shealy	(1975)	
14.0	14.0-16.0	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 escholtzii</u>	CA Brattstrom (1963)		
002	12.3	0.4	12.0-12.6	<u>Ensatina escholtzii</u>	OR? Brattstrom (1963)
006	12.0	0.7		<u>Ensatina escholtzii</u>	Nov CA Lynch (1974)
002	13.8	0.2	13.6-13.9	<u>Ensatina escholtzii</u>	Nov CA Hendrickson (1949)
002	09.3	0.4	09.0-09.5	<u>Ensatina escholtzii</u>	CA Brattstrom (1963)
001	20.0			<u>Ensatina escholtzii</u>	CA Stebbins (1954)
001	01.0			<u>Ensatina escholtzii</u>	Feb CA Stebbins (1954)
001	01.0			<u>Ensatina escholtzii</u>	Jan CA 1670 M Stebbins (1954)
002	16.0	0.0	16.0-16.0	<u>Ensatina escholtzii</u>	Oct CA Stebbins (1954)
002	12.8	0.7	12.3-13.3	<u>Ensatina escholtzii</u>	Aug CA Stebbins (1954)
108	10.8	01.0-20.0	<u>Ensatina escholtzii</u>	CA Stebbins (1954)	
011	08.3	02.5-17.5	<u>Ensatina escholtzii</u>	Oct-Apr CA Stebbins (1954)	
046	08.8	02.5-17.0	<u>Ensatina escholtzii</u>	CA Stebbins (1954)	
004	13.8	11.5-15.7	<u>Ensatina escholtzii</u>	Mar Baja Norte, Mexico Mahrdt (1975)	
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 bislineata</u>	Feb Vernberg (1953)
001	08.0			<u>Eurycea 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		Eurycea <u>bislineata</u>	Winter OH Ashton (1975)	
003	02.5-04.5		Eurycea <u>bislineata</u>	Winter OH Ashton (1975)	
003	02.0-04.0		Eurycea <u>bislineata</u>	Winter OH Ashton (1975)	
001	02.5-06.0		Eurycea <u>bislineata</u>	Winter OH Ashton (1975)	
001	05.0		Eurycea <u>bislineata</u>	Dec OH Ashton (1975)	
002	03.0	0.0	03.5-03.5	Eurycea <u>bislineata</u>	Dec OH Ashton (1975)
001	18.2		Eurycea b. <u>wilderae</u>	Jul VA Bogert (1952)	
004	15.9		15.5-16.6	Eurycea b. <u>wilderae</u>	Jul VA Bogert (1952)
003	17.5		15.0-22.0	Eurycea <u>longicauda</u>	Ark Spotila (1972)
			08.0-19.0	Eurycea <u>longicauda</u>	VA Hutchison (1958)
011	15.6		13.5-22.2	Eurycea <u>lucifuga</u>	Ark Spotila (1972)
			08.0-19.0	Eurycea <u>lucifuga</u>	VA Hutchison (1958)
			14.8-16.0	Eurycea <u>multiplicata</u>	griseogaster Throughout year Arkansas Ireland (1976)
			14.0-18.9	Eurycea <u>multiplicata</u>	griseogaster Throughout year Arkansas Ireland (1976)
			00.0-21.0	Eurycea <u>multiplicata</u>	griseogaster Throughout year Arkansas Ireland (1976)
002	26.3	0.1	26.2-26.3	Eurycea [ <u>Manculus</u> ] <u>quadrigitatus</u>	Texas Brattstrom (1963)
			12.0	Gyrinophilus <u>palleucus</u>	Dent and Kirby-Smith (1963)
017	08.1	2.8	05.0-16.0	Gyrinophilus <u>porphyriticus</u>	Apr NY Feder (Unpublished)
013	11.4	1.3	10.0-14.0	Hydromantes <u>brunus</u>	Mar 73 Hell Hollow, Mariposa Co, CA Under rocks on hillside ***
024	05.7		-2.0-11.5	Hydromantes <u>platycephalus</u>	CA Brattstrom (1963)
001	07.1		Hydromantes <u>platycephalus</u>	CA 10800' Bogert (1952)	
008	15.0	1.4	13.8-17.8	Hydromantes <u>platycephalus</u>	Jul 81 NE Face sierra buttes, Sierra Co, CA 2125 M Under rocks ***
001	16.0		Hydromantes <u>platycephalus</u>	Jul 81 Ibid 2200 M ***	
12.2			Hydromantes <u>shastae</u>	Jun CA Brattstrom (1963)	
001	12.2		Hydromantes <u>shastae</u>	Mar CA Bury et al. (1969)	
039	16.2		11.6-22.8	Plethodon <u>caddoensis</u>	Arkansas Spotila (1972)
			09.5-17.5	Plethodon <u>cinerous</u>	May-Jun Mich Test and Bingham (1948)
			07.0-20.0	Plethodon <u>cinerous</u>	May-Jun Mich Test and Bingham (1948)
134	18.5	0.6	16.8-20.0	Plethodon <u>cinerous</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 NV Feder (Unpublished)
008	15.7	0.3	15.3-16.0	<u>Plethodon cinereus</u>	Aug NV Feder (Unpublished)
114	18.3	2.1	14.1-22.0	<u>Plethodon cinereus</u>	Jun-Jul NV 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</u>	serratus Ark Spottia (1972)
008	12.0		11.4-13.0	<u>Plethodon dorsalis</u>	Ark Spottia (1972)
002	11.1	2.7	09.2-13.0	<u>Plethodon dunni</u>	Brattstrom (1963)
017	10.8			<u>Plethodon dunni</u>	OR Stebbins (1951)
002	15.1		14.4-15.8	<u>Plethodon glutinosus</u>	Ark Spottia (1972)
033	15.2		12.2-19.5	<u>Plethodon glutinosus</u>	Ark Spottia (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 Spottia (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)

## DATE, LOCALITY, ELEVATION, ETC.

N	MEAN	SD	RANGE	SPECIES	
004	10.5	1.4	09.2-12.5	<u>Plethodon vehiculum</u>	Brattstrom (1963)
001	22.0			<u>Typhlonolge Rathbuni</u>	Texas -45 M Brattstrom (1963)
				B. NON-PLETHODONTIDS:	
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>Ambystoma jeffersonianum</u>	Aug Minn. Brattstrom (1963)
001	19.0			<u>Ambystoma jeffersonianum</u>	Jul Minn. Brattstrom (1963)
<01.0				<u>Ambystoma jeffersonianum</u>	Mar NY Feder (Unpubl.)
			06.0-07.9	<u>Ambystoma jeffersonianum</u>	Mar-Apr NJ Panek (1980)
054	12.9	5.5		<u>Ambystoma jeffersonianum</u>	Throughout year Maryland Thompson et al. (1980)
			06.0-07.8	<u>Ambystoma platinaeum</u>	Mar-Apr NJ Panek (1978)
005	21.0			<u>Ambystoma macrodactylum</u>	CA 1850 M Brode (1967)
223	14.2		06.0-22.0	<u>Ambystoma macrodactylum</u>	croceum Throughout yr CA Terrestrial Anderson (1968)
006	09.8		09.0-10.4	<u>Ambystoma macrodactylum</u>	croceum Throughout yr CA In pond Anderson (1968)
			15.2	<u>Ambystoma macrodactylum</u>	crocaum Throughout yr CA Under cover Anderson (1968)
068	11.4		06.0-16.0	<u>Ambystoma macrodactylum</u>	croceum Throughout yr CA Migrating Anderson (1968)
012	15.2			<u>Ambystoma macrodactylum</u>	croceum Jan CA Anderson (1968)
019	08.9			<u>Ambystoma macrodactylum</u>	croceum Jan CA Anderson (1968)
12.2			10.5-23.2	<u>Ambystoma macrodactylum</u>	croceum CA Larvae Anderson (1968)
150	15.1		07.0-25.0	<u>Ambystoma macrodactylum</u>	croceum CA Larvae Anderson (1968)
014	11.5		06.2-16.0	<u>Ambystoma macrodactylum</u>	croceum Jan CA Adult terrestrial Anderson (1968)
012	11.7		09.0-13.2	<u>Ambystoma macrodactylum</u>	croceum Feb CA Adult terrestrial Anderson (1968)
016	12.3		11.5-13.5	<u>Ambystoma macrodactylum</u>	croceum Mar CA Adult terrestrial Anderson (1968)
010	11.5		10.0-12.5	<u>Ambystoma macrodactylum</u>	croceum Apr CA Adult terrestrial Anderson (1968)
013	18.4		15.4-22.4	<u>Ambystoma macrodactylum</u>	croceum Jun CA Adult terrestrial Anderson (1968)
010	17.7		16.0-19.4	<u>Ambystoma macrodactylum</u>	croceum Aug CA Adult terrestrial Anderson (1968)
017	19.1		15.2-20.2	<u>Ambystoma macrodactylum</u>	croceum Sep CA Adult terrestrial Anderson (1968)
015	16.3		14.4-18.0	<u>Ambystoma macrodactylum</u>	croceum Sep CA Adult terrestrial Anderson (1968)
011	11.3		09.0-12.8	<u>Ambystoma macrodactylum</u>	croceum 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</u>	<u>groceum</u>	Nov CA	Adult	terrestrial Anderson (1968)
027	08.6		04.0-16.0	<u>Ambystoma macrodactylum</u>	<u>sigillatum</u>	Jun-Jul CA	Adults	Anderson (1968)
010			03.4-04.0	<u>Ambystoma macrodactylum</u>	<u>sigillatum</u>	Jul CA	Adults	Anderson (1968)
			03.4-11.0	<u>Ambystoma macrodactylum</u>	<u>sigillatum</u>	CA	Eggs	Anderson (1968)
055	07.4		04.0-14.2	<u>Ambystoma macrodactylum</u>	<u>sigillatum</u>	Spring CA	Larvae	Anderson (1968)
010	23.1		22.0-24.5	<u>Ambystoma macrodactylum</u>	<u>sigillatum</u>	Jul-Aug CA	Larvae	Anderson (1968)
			09.0-21.0	<u>Ambystoma macrodactylum</u>	<u>sigillatum</u>	Summer CA	Larvae	Anderson (1968)
002	08.3	0.1	08.2-08.3	<u>Ambystoma maculatum</u>	Apr	Nr	Brattstrom	(1963)
<01.0				<u>Ambystoma maculatum</u>	Mar	Nr	Feder (Unpubl.)	
			08.0-23.0	<u>Ambystoma maculatum</u>	(eggs)	NV	Pough (1976)	
			17.0-32.0	<u>Ambystoma maculatum</u>	Jul	NV	Pough and Wilson (1970)	
002	23.9	0.1	23.8-24.0	<u>Ambystoma opacum</u>	May	NY	Brattstrom	(1963)
001	16.0			<u>Ambystoma opacum</u>	May	Alabama	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>	Colo (8300')	Stebbins (1951)		
051	02.0		02.0-07.0	<u>Ambystoma tigrinum</u>	McCleure (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)		

N	MEAN	SD	RANGE	SPECIES	DATE, LOCALITY, ELEVATION, ETC.
			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</u>	Feb OK Black (1969)
003	24.0		24.0-24.0	<u>Amphiuma means</u>	Sept Florida Brattstrom (1963)
			09.8-22.5	<u>Cryptobranchus alleganiensis</u>	Throughout year NO 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)
			OB.0-26.0	<u>Pseudobranchus striatus</u>	Throughout year FLA Ultsch (1973)
			002	<u>Rhyacotriton olympicus</u>	Apr CA Stebbins (1951)
			002	<u>Rhyacotriton olympicus</u>	Mar CA Stebbins (1951)
			002	<u>Rhyacotriton olympicus</u>	Apr CA Stebbins (1951)
			003	<u>Rhyacotriton olympicus</u>	Nov CA Stebbins (1951)
			002	<u>Rhyacotriton olympicus</u>	Mar CA Stebbins (1951)
			004	<u>Rhyacotriton olympicus</u>	Nov CA Stebbins (1951)
			004	<u>Rhyacotriton olympicus</u>	Apr OR Stebbins (1951)
			001	<u>Rhyacotriton olympicus</u>	Apr WA Stebbins (1951)
			004	<u>Rhyacotriton olympicus</u>	Apr WA Stebbins (1951)
			001	<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 Uitsch (1973)
	08.0-26.0			<u>Siren lacertina</u>	Throughout year Fla Uitsch (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	<i>Bolitoglossa franklini</i> (ca. 2000 M)		
09.0	18.0	09.0	<i>Bolitoglossa franklini</i> (ca. 2350 M)		
17.8	24.0	06.2	<i>Bolitoglossa occidentalis</i>		
10.5	16.0	05.5	<i>Bolitoglossa resplendens</i>		
07.8	18.2	10.4	<i>Bolitoglossa rostrata</i> (SM Transect)		
05.5	14.4	08.9	<i>Bolitoglossa rostrata</i> (Xantehuitz)		
10.6	15.5	04.9	<i>Chiropterotriton bromeliaceus</i>		
09.0	13.5	04.5	<i>Chiropterotriton dimidiata</i>		
08.0	13.8	05.8	<i>Chiropterotriton multidentatus</i>		
03.0	15.8	12.8	<i>Pseudoeurycea rex</i>		
08.0	13.0	05.0	<i>Pseudoeurycea rex</i> -like'		
<b>Tropical non-plethodontids:</b>					
16.0	29.0	13.0	<i>Ambystoma amblycephalum</i> (1920-2130 M)	Same as minimum	
14.3	25.0	10.7	<i>Ambystoma dumieri</i>	Same as minimum	
18.0	23.0	05.0	<i>Ambystoma flavipiperatum</i>	Lynch (1974)	
16.0	18.0	02.0	<i>Ambystoma granulosum</i> (2360-2490 M)	Same as minimum	
13.0	18.0	05.0	<i>Ambystoma ordinarium</i> (1970-2100 M)	Same as minimum	
15.0	26.0	11.0	<i>Ambystoma tigrinum</i> (2250-2360 M)	Same as minimum	
14.0	26.0	12.0	<i>Ambystoma rosaceum</i> (2450-2600 M)	Same as minimum	
13.0	20.0	07.0	<i>Ambystoma zacapu</i>	Same as minimum	
15.0	20.5	05.5		Fitzpatrick (1973a)	
<b>Temperate plethodontids:</b>					
02.2	18.5	16.3	<i>Anides flavipunctatus</i>	Rosenthal (1957)	
02.1	19.0	16.9	<i>Anides lugubris</i>	Hendrickson (1954)	
02.2	15.8	13.6	<i>Batrachoseps attenuatus</i>	Cunningham (1960)	
04.0	21.0	17.0	<i>Batrachoseps pacificus</i>	Ashton (1975)	
01.0	22.0	21.0	<i>Desmognathus fuscus</i>	Shealy (1975)	
02.0	20.0	18.0	<i>Desmognathus monticola</i>	Fitzpatrick (1973b)	
01.0	19.0	18.0	<i>Desmognathus ochrophaeus</i>	Stebbins (1954)	
01.0	20.0	19.0	<i>Ensatina escholtzii</i>	Ashton (1975)	
01.0	20.0	19.0	<i>Eurycea bislineata</i>	Hutchison (1958)	
08.0	22.0	14.0	<i>Eurycea longicauda</i>	Hutchison (1958)	
08.0	22.2	14.2	<i>Eurycea lucifuga</i>	Ireland (1976)	
00.0	21.0	21.0	<i>Eurycea multipunctata griseogaster</i>	Ireland (1976)	
14.9	16.0	01.2	<i>Eurycea multipunctata griseogaster</i>	Brattstrom (1963)	
-2.0	11.5	13.5	<i>Hydromantes platycephalus</i>	Vernberg (1953)	
03.0	22.0	19.0	<i>Plethodon cinereus</i>		
<b>Temperate non-plethodontids:</b>					
01.0	22.3	21.3	<i>Ambystoma jeffersonianum</i>	Feder (Unpublished)	
06.2	25.0	18.8	<i>Ambystoma macrodactylum croceum</i>	Anderson (1968)	
03.4	24.5	21.1	<i>Ambystoma macrodactylum sanguineum</i>	Anderson (1968)	
01.0	32.0	31.0	<i>Ambystoma maculatum</i>	Feder (Unpublished)	
06.2	24.0	17.8	<i>Ambystoma tigrinum</i>	Whitford and Massey (1970)	
09.8	28.0	18.2	<i>Cryptobranchus alleganiensis</i>	Nickerson and Mays (1973)	
09.2	16.2	07.0	<i>Dicamptodon ensatus</i>	Brattstrom (1963)	
07.8	28.4	20.6	<i>Notophthalmus viridescens</i>	Uitsch (1973)	
08.0	26.0	18.0	<i>Pseudobranchus striatus</i>	Stebbins (1951)	
05.8	09.6	03.8	<i>Rhyacotriton olympicus</i>	Coates et al. (1970)	
04.5	18.4	13.9	<i>Taricha granulosa</i>	Uitsch (1973)	
08.0	26.0	18.0	<i>Siren intermedia</i>	Uitsch (1973)	
08.0	26.0	18.0	<i>Siren lacertina</i>	Uitsch (1973)	

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
<b>Tropical plethodontids:</b>				
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>Chiroppterotriton bromeliacea</u>
07.8	0	16.2	0	<u>Chiroppterotriton chiropterus</u>
10.2	1	14.0	1	<u>Chiroppterotriton chondrostega</u>
09.0	1	13.5	0	<u>Chiroppterotriton dimidiata</u>
08.0	1	13.8	0	<u>Chiroppterotriton 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 pennatus</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>
<b>Tropical ambystomatids:</b>				
16.0	1	29.0	0	<u>Ambystoma amblycephalum</u>
14.3	1	25.0	0	<u>Ambystoma dumerili</u>
18.0	1	23.0	0	<u>Ambystoma flavipiperatum</u>
16.0	1	18.0	0	<u>Ambystoma granulosum</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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