

Article

The Craneflies of Lebanon (Insecta, Tipuloidea: Tipulidae, Limoniidae & Pediciidae)

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ABSTRACT

This study is a survey of the distribution of Diptera in the whole of Lebanon. 16 watersheds of the largest rivers were explored between 1979 and 2010, covering a wide variety of running waters distributed between 0 and 2150 m of altitude from springs and streams to the lower sectors of rivers, as well as high altitude marshes. 365 imagos of Tipulidae, Limoniidae and Pediciidae were identified to the species level at 84 out of 200 stations surveyed within the program of general inventory of macroinvertebrate fauna. 35 species have been identified. 9 of these species (1 Tipulids, 8 Limoniids) are new to the fauna of Lebanon. On the other hand, fourteen species, recorded in the past by other authors, were not observed again in our samples. The total number of potential species of these Diptera all over the Lebanese territory is thus raised to 52.

Keywords: Diptera, distribution, Lebanon, whole territory, 16 catchments, running water, stagnant water, new records.

Diptères Tipuloïdes du Liban (Insecta, Tipuloidea : Tipulidae, Limoniidae, Pediciidae)

RÉSUMÉ

La présente étude a pour but d'étudier la répartition des Diptères du Liban par des prospections étendues à la totalité de son territoire. 16 bassins versants des plus grandes rivières, ont ainsi été étudiés entre 1979 et 2010, concernant une grande variété d'eaux courantes, depuis les sources et ruisselets jusqu'aux secteurs inférieurs des rivières, ainsi que les marais de haute altitude. 365 imagos de Tipulidae, Limoniidae et Pediciidae ont été déterminés spécifiquement à 84 stations (réparties entre 0 et 2 150 m d'altitude) sur les 200 prospectées par le programme d'inventaire général de la faune de macroinvertébrés. 35 espèces ont été identifiées sans réserve, dont neuf (1 Tipulidae, 8 Limoniidae) sont nouvelles pour la faune du Liban. 14 espèces signalées par d'autres auteurs n'ont pas été retrouvées. Le nombre d'espèces potentielles de ces Diptères sur le territoire libanais est porté à 52.

Mots-clés : Diptera, répartition, Liban, totalité du territoire, 16 bassins versants, eaux courantes et stagnantes, citations nouvelles.

1. Introduction

The works of LACKSCHEWITZ (1939), THOMAS & DIA (1982), DIA & THEOWALD (1982), DIA (1983), VERMOOLEN (1983), THEOWALD & OOSTERBROEK (1987), OOSTERBROEK (1997, 2009, 2020), STARÝ (1994, 2004, 2009, 2014), STARÝ et al. (2012), constitute the only studies on Tipulidae, Limoniidae and Pediciidae from Lebanon and neighboring countries. We have carried out recent research on the aquatic invertebrates of 16 hydrographic networks of this country, providing new faunistic and ecological data on these Diptera.

2. Localities studied

The material used for this study consists of the Diptera from three families as adults (365 imago). 195 samples were obtained using entomological hand nets (sight hunts) and bright white light (Petromax) with Butane gas (night hunts). Table 1 lists the sites where samples have been collected (Fig. 1).

3. Results and discussion

The fauna of the families Tipulidae, Limoniidae and Pediciidae as is now known from Lebanon consists of 52 species-group taxa. Altogether 37 species were collected during the present research, three of which could only be identified to the genus level. These are indicated in bold in the list following. 9 species (1 Tipulidae, 8 Limoniidae) are recorded for the first time from Lebanon and are marked with a double asterisk (**). Fourteen species (1 Tipulidae, 13 Limoniidae) come from other collections and are not represented in my material (marked with an *).

List of Tipuloidea from Lebanon

TIPULIDAE (2 genera, 19 species)

1. *Nephrotoma beckeri* (Mannheims): 7, 11, 15, 34, 42, 46, 48, 49, 51, 55, 57, 70, 72.

2. *N. cornicina* (Linnaeus): 16.

3. *N. minuscula* (Mannheims): 55, 57, 64.

4. *N. parvinotata* (Brunetti) : 45.

5. *N. scalaris* (Meigen) :10, 45, 49, 52, 56, 60, 73, 75.

6. *Tipula (Acutipula) latifurca* Vermoolen: 5, 20, 21, 23, 25, 28, 37.

7. *T. (A.) libanica* Vermoolen: 47, 57, 60, 61, 63.

8. *T. (Lunatipula) angela* Mannheims: 2, 5, 29, 38, 52.

9. *T. (L.) angelica* Theowalds: 65.

10. *T. (L.) berythia* Mannheims: 53.

11. *T. (L.) cedrophila* Mannheims: 30.

12. *T. (L.) kybele* Mannheims: 15, 70.

13. *T. (L.) peliostigma* Schummel **: 65.

14. *T. (L.) pseudopeliostigma* Mannheims *

15. *T. (Savtshenkia) baltistanica* Alexander : 21, 28.

16. *T. (S.) rufina rufina* Meigen: 9, 20, 29, 30, 35, 46, 52, 55, 57, 61, 84.

17. *T. (Tipula) orientalis* Lackschewitz 4, 23, 52, 56, 60, 67, 76, 77, 78, 81, 82, 83.

18. *T. (Vestiplex) relictia* Dia & Theowald: 46.

19. *T. (Yamatotipula) lateralis* Meigen: 1, 8, 11, 13, 14, 15, 16, 17, 18, 22, 23, 27, 32, 33, 36, 40, 41, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 62, 63, 64, 66, 67, 68, 70, 74, 75, 76, 77, 78, 79.

LIMONIIDAE (15 genera, 25 species + 3 taxa)

Limnophilinae

20. *Dicranophragma (Brachylimnophila) adjunctum* (Walker) *

21. *Paradelphomyia* sp.: 2.

22. *Phylidorea* sp.: 2, 80.

Chioneinae

23. *Ellipteroides (Ellipteroides) lateralis* (Macquart) *

24. *E. (Protogonomyia) alboscuteatus* (von Roser) *

25. *E. (Ptilostenodes) omissus* (Lackschewitz)*

26. *Erioptera (Erioptera) lutea* Meigen **: 1.

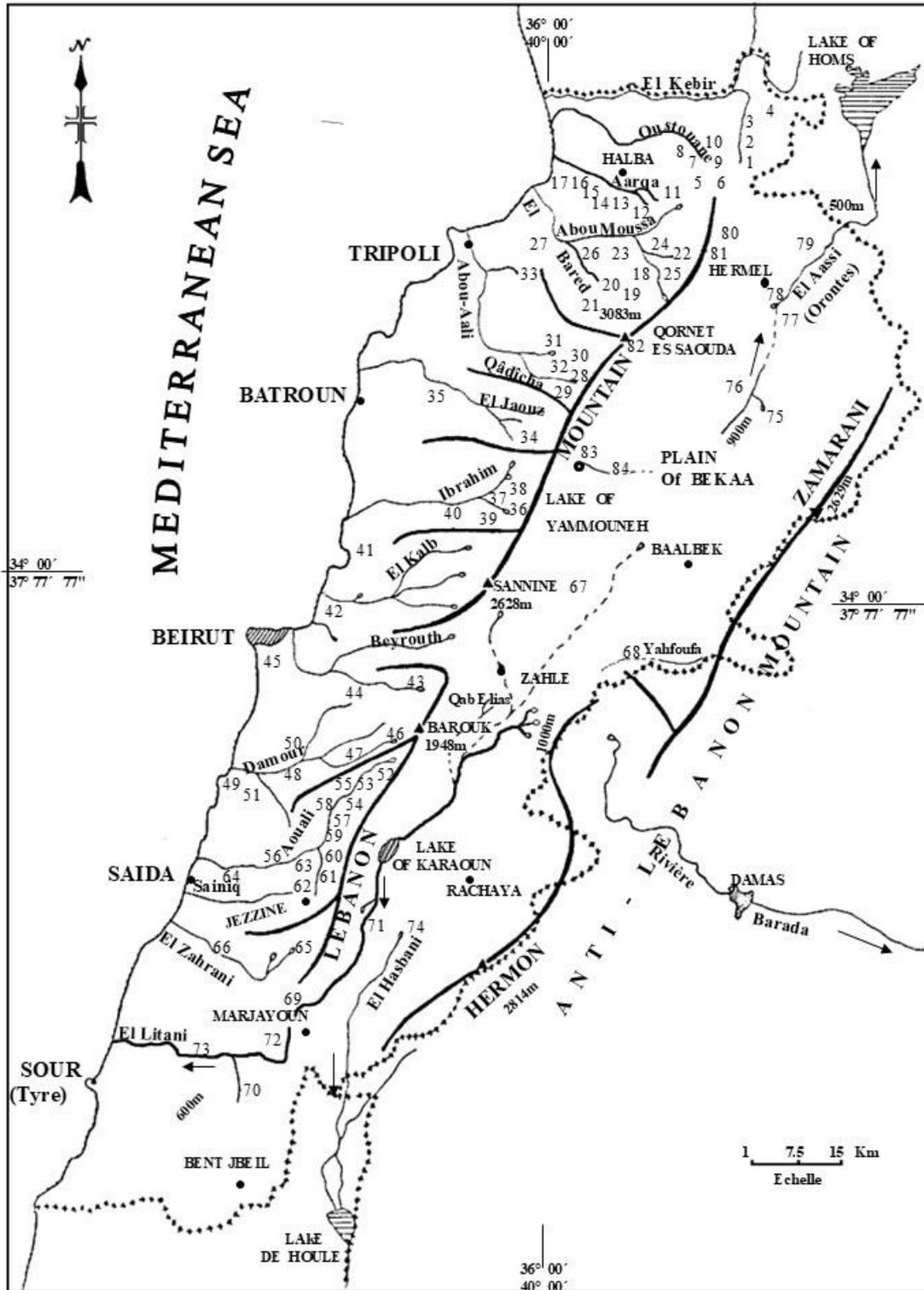


Figure 1. Map of Lebanon showing the hydrographic network. All collecting locations are indicated by numbers.
 Figure 1. Carte du Liban montrant les réseaux hydrographiques. Tous les lieux de collecte sont indiqués par des chiffres.

Table 1. Collecting stations. Localities are listed and numbered per river basin (S= station).

Tableau 1. Stations de collecte. Les localités sont listées et ordonnées par bassins versants (S= station).

No.	River	Years	Area (km ²)	Length (km)	Station	Site	Altitude (m)
I	Nahr El Kebir	1998, 2005, 2008, 2009, 2010	1000	60	S1	Delbe Spring	1360
					S2	Magl Bal spring	1330
					S3	Chadra stream (Village)	373
					S4	Es Safa spring	380
II	Nahr Oustouane	1998, 1999, 2000	160	22	S5	Nabaa Hamadé spring	950
					S6	Nabaa El Jaouz spring	840
					S7	Downstream Nabaa El Banat Spring	824
					S8	Nabaa Esh Shouh spring	1240
					S9	Nabaa Kharrar spring	950
					S10	Aîn Taba spring	727
III	Nahr Aarqa	2000	153	20	S11	Nabaa El Fouâr spring (near Rahbe village)	592
					S12	Aîn Daya'a spring (inside Rahbé village)	555
					S13	Upstream of the El Houaïch bridge (near the village of El Houaïch)	480
					S14	Ain el Gazlan spring	480
					S15	Upstream from El Aiyoûna bridge (Nahr Châne)	300
					S16	Aarqa upstream from the Bqerzla waterfall (village)	130
					S17	Aarqa at Aarqa bridge (Tripoli-Halba road)	75
IV	Nahr El Bared	1996, 1997, 2000, 2001	277	24	S18	S18 Nabaa Brissa spring	2100
					S19	Nabaa Sokkar spring	1650
					S20	El Ksaim spring	1100
					S21	Nabaa Sîr El Danniyeh spring	950
					S22	Ouâdi Ras En Nahr stream	1800
					S23	Nabaa Es Sirwane spring	2042
					S24	Downstream spring Taqwé	2044
					S25	Aîn El Bayda spring	2113
					S26	Abou Moussa upstream of the Moussa dam	240
					S27	Abou Moussa downstream of the Moussa dam	190
V	Nahr Abou Aali	1995, 1996, 1997, 1999	484	42	S28	Nabaa Qâdîcha spring	1760
					S29	Downstream Qâdîcha spring	1500
					S30	Nabaa Nbat spring	1750
					S31	Nabaa Mâr Sarkis spring	1580
					S32	El Houkailate spring (near Misiera village)	1240
					S33	Nabaa Rachaaîne spring	136

No.	River	Years	Area (km ²)	Length (km)	Station	Site	Altitude (m)
VI	Nahr El Jaouz	1996	198	38	S34	Nabaa El Korsi spring (near the village of Ouata Hoûb)	1360
					S35	El Jaouz upstream of Kfar Hilda waterfall and Bsâtine El Aossi (village)	1330
VII	Nahr Ibrahim	1995, 2002, 2004, 2005	330	30	S36	Afqa spring	1200
					S37	Downstream Afqa spring	1020
					S38	Rouais spring	1300
					S39	Rouais stream at Yâhnoûh (village)	1015
					S40	Janné village	730
VIII	Ghazir	1997			S41	Ghazir stream	383
IX	Nahr El Bared	2008	260	30	S42	El Kalb in El Mokhada	50
X	Nahr Beirut	1995, 2005, 2007	231	29	S43	Downstream Chaghour Hammana	1200
					S44	Beirut at Ras bridge El Metn	450
					S45	Beirut city	10
XI	Nahr Damour	1980, 1981, 1982, 1997	288	33	S46	Nabaa es Safa spring and stream of Ain Dara = Nahr es Safa	1000
					S47	downstream Nahr es Safa	950
					S48	Jisr el Quâdi	260
					S49	Jisr ed Damour	40
					S50	stream Ouâdi el Ghâboun (temporary)	260
					S51	Nahr el Hammam	45
XII	Nahr Aouali (Awali)	979,1980, 1981, 1982	302	48	S52	Nabaa el Barouk spring	1080
					S53	downstream Nabaa el Barouk spring	1064
					S54	Jisr el Misri bridge	1050
					S55	Jdaidet ech Choûf bridge	710
					S56	Jisr Bisri bridge	380
					S57	Nabaa Mourched spring and stream	800
					S58	Ras el Ain spring	850
					S59	stream of Nabaa Salman spring	800
					S60	Nabaa Bâch ech Choûf spring	820
					S61	Nabaa Aazibi spring and stream	990
					S62	Nabaa Jezzîne spring and stream	950
					S63	downstream Jezzîne (Wadi Jezzîne)	690
					S64	Nabaa Joun spring and stream (Fouar es Saraaouniyé)	36
					XIII	Nahr El Zahrani	2004, 2005
S66	Zahrani at Kaferoua (village)	200					
XIV	Nahr Litani	1984,1985, 1995,2000, 2005	2170	170	S67	Sifri temporary spring	1000
					S68	Yahfoufa stream	1000-1150
					S69	Ez Zarka spring	550
					S70	Maidani spring	420
					S71	bridge at Ouadi Ghandouriyé	125
					S72	jisr Pont Khardalé	240
					S73	Upstream from Zrairiyé bridge	50

No.	River	Years	Area (km ²)	Length (km)	Station	Site	Altitude (m)
XV	Nahr Hasbani	2004,2005	526	21	S74	Hasbani spring near the village Hasbaya	545
XVI	Orontes	1984, 1985, 1987, 1996, 2000, 2001, 2004	1870	46	S75	El Laboué spring (village)	900
					S76	Jabboulé stream(village)	840
					S77	Aîn El Zarka spring	650
					S78	Orontes upstream of the Hermel bridge (village)	610
					S79	Orontes downstream from Chwaghir (village)	570
					S80	El Haour spring and marshes	1730
					S81	El Jammâssia spring and marsh	1720
					S82	Aayoun Orghouche spring and marsh	2100
					S83	Lake Yammouné	1250-1350
					S84	Chlifa stream	1100

27. *Molophilus (Molophilus) banias* Starý & Freidberg **:4

28. *M. (M.) obscurus* (Meigen): 80.

29. *M. (M.) pleuralis* de Meijere **: 80.

30. *M. (M.) vafer* Lackschewitz *

31. *Ormosia (Ormosia) filifera* (Lackschewitz)*

32. *Ormosia* sp.: 2.

33. *Rhabdomastix (Rhabdomastix) filata* Starý*

34. *Symplecta (Symplecta) hybrida* (Meigen) *
Limoniinae

35. *Antocha (Antocha) libanotica* Lackschewitz: 61

36. *A. (A.) phoenicia* Thomas & Dia: 48, 49, 51, 55, 56, 57.

37. *A. (A.) vitripennis* (Meigen) **: 26.

38. *Dicranomyia (Dicranomyia) flavigena* Starý & Freidberg **: 71.

39. *D. (D.) melanantha* Savchenko *

40. *D. (D.) pallidinota* Starý *

41. *D. (D.) signatella* Starý & Freidberg **: 2, 38.

42. *D. (D.) cf. mitis* (Meigen): 4, 12, 27, 69, 74.

43. *Dicranoptycha fuscescens* (Schummel) *

44. *Geranomyia cf. caloptera* Mik:16, 26.

45. *Limonia macrostigma* (Schummel) **: 22, 24.

46. *L. nubeculosa* Meigen **: 1.

47. *L. nussbaumi* Starý & Freidberg: 6, 13.

48. *Orimarga (Orimarga) virgo* (Zetterstedt)*
PEDICIIDAE (3 genera, 4 species)

49. *Dicranota (Paradicranota) landrocki* Czi-
zek: 1, 19, 22, 28, 29.

50. *D. (P.) simulans* Lackschewitz *

51. *Pedicia (Amalopsis) occulta* (Meigen): 8, 20, 28.

52. *Tricyphona (Tricyphona) immaculata* (Meigen): 24

Looking at the number of species listed by basin (Table 2), Litani, the longest river, has a small number of species (7), but the shorter El Kebir and El Bared rivers are, have exceptionally the largest number of species (13). These differences, however, should not be given too much importance, considering that the research effort on the different hydrographic networks has been very uneven.

Table 2: Number of species and Distribution of Tipulid, Limoniid and Pediciid Diptera (imagos: m = male; f= female, T = total material collected) in the 16 main rivers/Basins of Lebanon.

Tableau 2 : Nombre d'espèces et répartition des Diptères Tipulides, Limoniïdes et Pediciïdes (imagos : m=mâle ; f=femelle, T= matériel total récolté) dans les 16 principales rivières du Liban.

Basin / Rivers	El Kébir	Oustouane	Aarqa	El Bared	Abou Aali	El Jaouz	Ibrahim	Ghazir	El Kalb	Beirouth	Darnour	Aouali	Zahrani	Litani	Orontes	Hasbani	Altitude amplitude in m Amplitude altitudinale en m
Species																	
TIPULIDAE T : 171m, 132f = 303 imagos																	
<i>Nephrotoma beckeri</i> (14m, 9f)		+	+			+			+		+	+		+			40-1525
<i>N. cornicina cornicina</i> (2f)			+														130
<i>N. minuscule</i> (5m, 3f)												+					36-820
<i>N. scalaris parvinotata</i> (1m)										+							20
<i>N. scalaris scalaris</i> (6m, 6f)		+		+						+	+	+		+	+		40-1100
<i>T. (Acutipula) latifurca</i> (10m, 3f)		+		+	+		+										900-2100
<i>T. (A.) libanica</i> (2m, 3f)											+	+					700-1000
<i>Tipula (Lunatipula) angela</i> (8m, 2f)	+	+			+		+					+					910-1580
<i>T. (L.) angelica</i> (1m)													+				700
<i>T. (L.) berytia</i> (1m)	+																370
<i>T. (L.) cedrophila</i> (1m,3f)					+												1750
<i>T. (L.) kybele</i> (2f)			+											+			125-300/1400
<i>T. (L.) peliostigma peliostigma</i> (1m)													+				700
<i>T. (Savtshenkia) baltistanica</i> (2m)				+	+												950-1760
<i>T. (S.) rufina rufina</i> (13m,19f)		+		+	+	+					+	+			+		700-1750

Basin / Rivers	El Kébir	Oustouane	Aarqa	El Bared	Abou Aali	El Jaouz	Ibrahim	Ghazir	El Kalb	Beirouth	Damour	Aouali	Zahrani	Litani	Orontes	Hasbani	Altitude amplitude in m Amplitude altitudinale en m
Species																	
<i>T. (Tipula) orientalis</i> (12m,10f)	+			+								+		+	+		370-2100
<i>T. (Vestiplex) relicta</i> (1m)											+						1000
<i>T. (Yamatotipula) lateralis</i> (93m, 70f)	+	+	+	+	+		+	+		+	+	+	+	+	+	+	40-2100
LIMONIIDAE																	
T: 24m, 27f =51 imagos																	
Limnophilinae																	
<i>Paradelphomyia</i> sp.(1f)	+																1330
<i>Phylidorea</i> sp.(2f)	+														+		1330
Chioneinae																	
<i>Erioptera (Erioptera) lutea</i> (1m)	+																1360
<i>Molophilus (Molophilus) banias</i> (1m, 1f)	+																380
<i>M. (M.) obscurus</i> (3m, 5f)															+		1730
<i>M. (M.) pleuralis</i> (1m)															+		1730
<i>M. sp.</i>					+												1760
<i>Ormosia</i> sp.(2f)	+																1330
Limoniinae																	
<i>Antocha libanotica</i>												+					990-1400
<i>A. phoenicia</i> (28m, f)											+	+			+		240
<i>A. vitripennis</i> (1m)				+													40-800
<i>Dicranomyia (s. str.) flavigena</i> (1m)														+			560

Basin / Rivers	El Kébir	Oustouane	Aarqa	El Bared	Abou Aali	El Jaouz	Ibrahim	Ghazir	El Kalb	Beirouth	Damour	Aouali	Zahrani	Litani	Orontes	Hasbani	Altitude amplitude in m Amplitude altitudinale en m
Species																	
<i>D. (D.) signatella</i> (1m, 2f)	+						+										1300-1330
<i>D. (s. str.) cf. mitis</i> (1m, 5f)	+		+	+										+		+	190-550
<i>Geranomyia cf. caloptera</i> (1m, 1f)			+	+													130-240
<i>Limonia macrostigma</i> (4m, 1f)				+													1800-2100
<i>L. nubeculosa</i> (1m)	+																1360
<i>L. nussbaumi</i> (2m, 1f)		+	+														480-840
<u>PEDICIIDAE</u> T: 7m,4f = 11 imagos																	
<i>Dicranota (Paradicranota) landrocki</i> (4m, 2f)	+		+	+	+												1360-1800
<i>Pedicia (Amalopis) occulta</i> (3m, 1f)				+	+												1100-1760
<i>Tricyphona (Tricyphona) immaculata</i> (1f)				+													2100
Richesse spécifique	13	8	7	13	9	2	4	1	1	3	7	10	3	7	8	2	

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