

## Annotated checklist of the amphibians of Mauritania (West Africa)

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**Abstract:** We present the first distributional checklist with commentaries of amphibians of Mauritania. This country contains 11 anuran species belonging to three families: Bufonidae (three species), Hyperoliidae (one species), and Ranidae (seven species). We report new distribution information, the first record of *Ptychadena* aff. *mascareniensis* and the second record of *Pyxicephalus edulis* in Mauritania. We removed two species from the list (*Bufo mauritanicus* and *Hildebrandtia ornata*). Most species are Afrotropical and inhabit the Sahel savannas of the south, while some occur in wet areas of the Sahara. There are believed to be 19 other unreported species in the country.

**Key words:** Amphibia, Anura, checklist, distribution, Mauritania.

**Resumen:** **Lista comentada de los anfibios de Mauritania (África occidental).** – Se presenta la primera lista comentada y se revisa la distribución de los anfibios de Mauritania. La diversidad es de 11 especies de anuros pertenecientes a tres familias: Bufonidae (tres especies), Hyperoliidae (una especie) y Ranidae (siete especies). Se aportan nuevos datos de distribución para las especies. *Ptychadena* aff. *mascareniensis* es citada por primera vez y *Pyxicephalus edulis* por segunda vez en Mauritania. *Bufo mauritanicus* e *Hildebrandtia ornata* son eliminadas de la lista. La mayoría de las especies son Afrotropicales, repartidas por las sabanas sahelianas del sur, aunque algunas ocupan zonas húmedas del Sahara. Se considera probable la presencia de otras 19 especies.

**Palabras clave:** Amphibia, Anura, distribución, lista comentada, Mauritania.

### INTRODUCTION

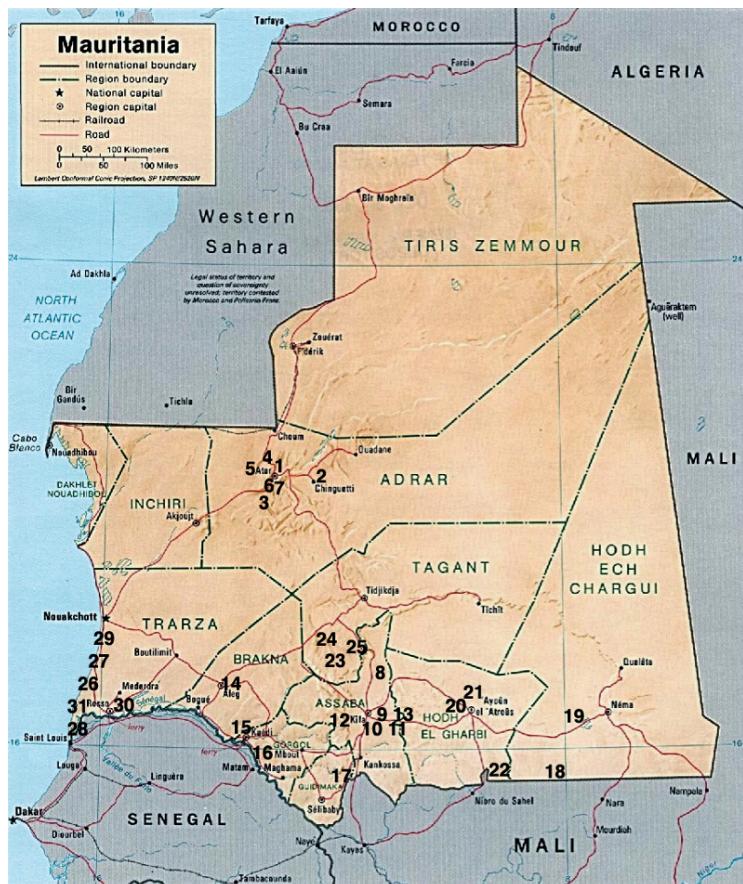
While research on amphibians and reptiles in Morocco and Western Sahara has been quite active in the last years (e.g. BONS & GENIEZ, 1996; SCHLEICH *et al.*, 1996; GENIEZ *et al.*, 2000, 2004), the amphibian fauna of Mauritania is still one of the least known faunas in northwestern Africa. A search in AMPHIBIAWEB (2004) renders only three species (*Bufo pentoni*, *Ptychadena trinodis*, and *Kassina senegalensis*) while the Amphibian Species of the World database (FROST, 2004) reports two species: *B. xeros* and *B. pentoni*. Nevertheless, these figures reflect a lack of interest in the study of Mauritania's fauna rather than the reality of its diversity. Published information on

Mauritania amphibians is sparse, often difficult to access and there are many data still unpublished. Most species were cited without providing exact localities and some possible mistakes should be revised. Furthermore, there are some taxonomic problems that could affect the status of some species in Mauritania.

French naturalists provided the first data on Mauritanian amphibian diversity. GUIBÉ (1950) reported three anuran species (*Bufo regularis*, *B. pentoni*, and *B. mauritanicus*). DEKEYSER & VILLIERS (1956), in their detailed work on the Adrar Mountains, reported five species: *B. mauritanicus*, *B. pentoni*, *Tomopterna cryptotis* (as "Pyxicephalus sp. *delalandii*?") and *Hoplobatrachus occipitalis* (as *Dicroglossus occipitalis*). Then, until the

end of the 1950s, only five species were cited. During the independence of the French colony and succeeding years, scientific activities were scarce in the country. In the eighties, LAMBERT (1984), based on DEKEYSER & VILLIERS (1956), mentioned *B. mauritanicus*, *B. xeros* and *D. occipitalis* from the Adrar. As there was no comprehensive species list when LE BERRE (1989) reviewed the published literature on Mauritanian herpetofauna, he was only able to provide information on the five already cited species. Subsequently,

INEICH (1997) found *B. regularis* and *T. cryptotis* in the coastal area of Diawling National Park; SCHLEICH *et al.* (1996) only mentioned *B. xeros* and *Hoplobatrachus occipitalis*, while SALVADOR (1996) cited *B. mauritanicus*, *B. pentoni*, *H. occipitalis*, and *T. cryptotis*. But references to the amphibian fauna from Mauritania were meagre until the beginning of the 21<sup>st</sup> century. BÖHME (2000; BÖHME *et al.*, 2001) cited *T. cryptotis* and *H. occipitalis* in the south. NICKEL (2001), in an unpublished report, offered a list of nine



**FIGURE 1.** Map of the Islamic Republic of Mauritania showing main administrative divisions (Wilayas). Numbers represent approximate location of localities cited for each species (see Appendix I for the name and coordinates of each locality).

**FIGURA 1.** Mapa de la República Islámica de Mauritania y sus principales divisiones administrativas (Wilayas). Los números representan la situación aproximada de las localidades citadas para cada especie (véase Apéndice I para el nombre y las coordenadas de cada localidad).

amphibian species, four of which were not previously reported: *Hildebrandtia ornata*, *Pyxicephalus edulis*, *Phrynobatrachus natalensis*, and *Ptychadena bibroni* (as *P. maccarthyensis*). The same author published a book on the diversity of vertebrates in the wetlands of southern Mauritania and reported *H. occipitalis*, *B. xeros*, *H. ornata*, *B. regularis* and *P. bibroni* (as *P. maccarthyensis*) (NICKEL, 2003). Finally, PADIAL (2003, 2004) provided the first record in Mauritania of the two Afrotropical species *Ptychadena trinodis* and *Kassina senegalensis*.

During April to August 2002, the senior author visited many suitable areas for amphibians in Mauritania. He found all the species that had been previously reported in the country as well as some new species. He also discovered previously unknown populations of some species. The aims of this paper are to 1) make available the first amphibian checklist for Mauritania, 2) report a new country record, 3) review the validity of some previous records, and 4) add distributional information and comments on the taxonomic status of some species in order to facilitate future research.

## METHODS

Common and easily identifiable species were collected by hand, photographed and released. Specimens were collected only when they belonged to species with taxonomic problems or when they were not previously reported for the country. They were sacrificed in ethanol 10° and fixed in 10% formalin. Specimens were deposited in the Museo Nacional de Ciencias Naturales, Madrid (MNCN). Tissue samples were deposited in the Collection of Tissues and DNA of the MNCN.

Study specimens were identified by comparing them with specimens in museums and in the literature (LE BERRE, 1989; SCHLEICH *et al.*, 1996; RÖDEL, 2000; RÖDEL & SPIELER, 2000). Published and unpublished literature concerning amphibian diversity was reviewed. In the following section, scientific names are followed by the exact locality (see Fig. 1 and Appendix I for coordinates and the Mauritanian Department or Wilaya of each locality). Localities where the author found the corresponding species are marked with an asterisk (\*).



FIGURE 2. *Bufo pentoni* Anderson, 1893 from Zoueina, Wilaya Hodh El Gharbi, Mauritania.

FIGURA 2. *Bufo pentoni* Anderson, 1893 de Zoueina, Wilaya Hodh El Gharbi, Mauritania.

## UPDATED CHECKLIST OF AMPHIBIANS OF MAURITANIA

### Bufonidae Gray, 1825

#### *Bufo pentoni* Anderson, 1893

**Distribution:** 2 km E of Aleg (MNCN), Zoueina\* (Fig. 2), without locality (GUIBÉ, 1950).

**Comments:** This species was cited repeatedly for the country without any particular locality (ANGEL & LOTHE, 1938; GUIBÉ, 1950; LE BERRE, 1989; NICKEL, 2001). The first concrete record is herein reported. This toad was found active during the night in temporary ponds in a gallery forest at Zoueina, in the Sahel Savannah of southern



**FIGURE 3.** *Bufo xeros* Tandy, Tandy, Keith & Duff-McKay, 1976 from Terjît, Wilaya Adrar, Mauritania.

**FIGURA 3.** *Bufo xeros* Tandy, Tandy, Keith & Duff-McKay, 1976 de Terjît, Wilaya Adrar, Mauritania.

Mauritania. NICKEL (2001) found this species to be abundant during the rainy season in the south of the country.

#### *Bufo regularis* Reuss, 1833

**Distribution:** Mahmûdé Lake\* (NICKEL, 2003), Chott Boul (INEICH, 1997), Dar es Salam (INEICH, 1997), 20 km N of N'Diago\*, Rosso (BRITO, 2003), Tamzakt (INEICH, 1997).

**Comments:** GUIBÉ (1950) already cited this species for Mauritania but all records previous to the taxonomic separation of *B. xeros* from *B. regularis* (TANDY *et al.*, 1976) are difficult to assign. DEKEYSER & VILLIERS (1956) cited two different species (*B. regularis* and *B. mauritanicus*) in relict wet areas (oasis and gueltas) of the Saharan mountains of Adrar. In the localities cited by these authors we only found *B. xeros*. We found *B. regularis* in the wetlands of the Sahel savanna in the southernmost part of the country. Records of *B. regularis* from Adrar region are herein assigned to *B. xeros* (see below) until the presence of *B. regularis* can be confirmed for this area. Thus, the distribution of *B. regularis* would be restricted to the south of the country as seen in LE BERRE (1989).

*Bufo xeros* Tandy, Tandy,  
Keith & Duff-MacKay, 1976

**Distribution:** Atar (DEKEYSER & VILLIERS, 1956; GENIEZ *et al.*, 2004), Chinguetti (DEKEYSER & VILLIERS, 1956), Iriji (DEKEYSER & VILLIERS, 1956), Kanoal, Oued Séguelil (DEKEYSER & VILLIERS, 1956), Guelta Handoum (DEKEYSER & VILLIERS, 1956), Guelta Molomhar (DEKEYSER & VILLIERS, 1956), Terjît\* (DEKEYSER & VILLIERS, 1956) (Fig. 3), Bou Bleï'îne\*, Bougari\* (NICKEL, 2003), Foum El Cherat\*, Guelta Metraucha (NICKEL, 2003), near Aleg (MNCN, GENIEZ *et al.*, 2004), Ayoûn El Atroûs\*, Zoueina\*, Guelta Matmata\*.

**Comments:** *Bufo mauritanicus* Schlegel, 1841 occurs in southern Morocco and northwestern Sahara (BONS & GENIEZ, 1996; GENIEZ *et al.*, 2004), but it was cited for the Mauritanian region (“région mauritanienne”) without locality by GUIBÉ (1950). DEKEYSER & VILLIERS (1956) also reported this species in the Adrar region. Subsequent authors give accounts of this species in the country based on previous records [see LAMBERT (1984) and GENIEZ *et al.* (2004) for Adrar and LE BERRE (1989)]. SCHLEICH *et al.* (1996) did not cite it for the country. We did not find this species



**FIGURE 4.** *Kassina senegalensis* (Duméril & Bibron, 1841) from Bou Bleï'îne, Wilaya Assaba, Mauritania.

**FIGURA 4.** *Kassina senegalensis* (Duméril & Bibron, 1841) de Bou Bleï'îne, Wilaya Assaba, Mauritania.

during our fieldwork and, moreover, SALVADOR (1996) considers as probably erroneous the records for Mauritania. We consider temptatively all the records of *B. regularis* and *B. mauritanicus* from the Adrar as *B. xeros*. In Terjît, in the Adrar mountain [a locality where DEKEYSER & VILLIERS (1956) cited *B. regularis*], *B. xeros* was common at night near water bodies. Choruses were heard during the night in June 2002 on the shore of lake Bou Bleï'îne. MATEO *et al.* (1997) stated that CHOPARD & VILLIERS (1950) had reported this species for the Mauritanian coast, but in the revision of this work we did not find such record. The species has been found in Auadi (western Sahara), a locality of the Azeffâl near the Mauritanian border (MATEO *et al.*, 1997; GENIEZ *et al.*, 2000). GENIEZ *et al.* (2004) illustrated one specimen from near Atar and one from near Aleg.

#### **Hyperoliidae Laurent, 1943**

##### ***Kassina senegalensis* (Duméril & Bibron, 1841)**

**Distribution:** Bou Bleï'îne\* (PADIAL, 2004) (Fig. 4).

**Comments:** This was the first family and species record for the country and the



**FIGURE 5.** *Hoplobatrachus occipitalis* (Günther, 1858) from Terjît, Wilaya Adrar, Mauritania.

**FIGURA 5.** *Hoplobatrachus occipitalis* (Günther, 1858) de Terjît, Wilaya Adrar, Mauritania.

northernmost record for the species. This Afrotropical species inhabits dry and wet savannas in central and West Africa (see RÖDEL, 2000). Only a young specimen was found, during the night, under a trunk on the shore of a permanent lake. It was found in the Sahel savannah, in an area surrounded by dunes. NICKEL (2001) expected the presence of this species in the country.

#### **Ranidae Rafinesque, 1814**

##### ***Hoplobatrachus occipitalis***

(Günther, 1858)

**Distribution:** Atar (DEKEYSER & VILLIERS, 1956), Guelta Handoum (DEKEYSER & VILLIERS, 1956), Guelta Molomhar (DEKEYSER & VILLIERS, 1956), Iriji (DEKEYSER & VILLIERS, 1956), Terjît\* (DEKEYSER & VILLIERS, 1956) (Fig. 5), Bou Bleï'îne\*, Bougari\* (NICKEL, 2003), Guelta Metraucha (NICKEL, 2003), Guelta Oumm Lebare\*, Mahmoûdé Lake (NICKEL, 2003), Ayoûn El Atroûs\* (BÖHME *et al.*, 2001), Zoueina\*, El Gheddiya (GENIEZ *et al.*, 2004), Guelta Fanar\*, Dara (INEICH, 1997), near Rosso (GENIEZ *et al.*, 2004).

**Comments:** This is a common species in wet areas of the Sahara region and in the Sahel savannah (LE BERRE, 1989; SALVADOR, 1996; GENIEZ *et al.*, 2004). It is active during the night, when it can be found at the shore of ponds and small streams. Tadpoles of an unidentified species of Ranidae were found near the Mauritanian border, in the Zemmour mountains (HASI *et al.*, 1997). Although GENIEZ *et al.* (2000) considered them as belonging to *Rana saharica* it cannot be discarded that they belonged to a relict population of *H. occipitalis*. Indeed, this amphibian was recently discovered in the extreme south-east of the western Sahara at Gleïb Ledjir, near the Mauritanian border (GENIEZ *et al.*, 2004). On 23 June 2002 we found tadpoles and juveniles in a pond of the



**FIGURE 6.** *Ptychadena* aff. *mascareniensis* (Duméril & Bibron, 1841) from Zoueina, Wilaya Hodh El Gharbi, Mauritania.

**FIGURE 6.** *Ptychadena* aff. *mascareniensis* (Duméril & Bibron, 1841) de Zoueina, Wilaya Hodh El Gharbi, Mauritania.

Guelta Fanar. GENIEZ *et al.* (2004) illustrated the specimen from El Gheddiya.

***Phrynobatrachus natalensis***  
(Smith, 1849)

**Distribution:** Kaedi (NICKEL, 2001)

**Comments:** NICKEL (2001) reported this Afrotropical species for first time in the Sahel savannah.

***Ptychadena bibroni*** (Hallowell, 1845)

**Distribution:** Kaedi (NICKEL, 2001), Mahmoûdé Lake (NICKEL, 2003).

**Comments:** NICKEL (2001, 2003) reported this Afrotropical species (as *P. cf. maccarthyensis*) for the first time in Mauritania in the Sahel savannah. He also mentioned unidentified *Ptychadena* spp. from Mahmoûdé Lake, Kiffa, and M'Bout.

***Ptychadena* aff. *mascareniensis***  
(Duméril & Bibron, 1841)

**Distribution:** Zoueina\* (Fig. 6).

**Comments:** This species had not previously been cited in the country. The specimen was active during the night of 19

June 2002, near a temporary pond in a gallery forest of the Sahel savannah. The taxonomy of West African *Ptychadena* is still unresolved (RÖDEL, 2000; VENCES *et al.*, 2004). There are indications of the existence of five separate species (clades) of *P. aff. mascareniensis* in Africa (VENCES *et al.*, 2004). The single specimen collected in Mauritania could probably be assigned to one of the available names from the northern African savannas (*P. marchei* Rochebrune, 1885 or *P. mascareniensis hylaea* Schmidt & Inger, 1959).

***Ptychadena trinodis*** (Boettger, 1881)

**Distribution:** Guelta Oumm Lebare\* (PADIAL, 2003), Guelta Metraucha (NICKEL, 2003).

**Comments:** NICKEL (2001) suspected that this species was present in the country. Specimen ZFMK 76870, reported by him as *Hildebrandtia ornata* for Guelta Metraucha (NICKEL, 2003), was in fact an adult male of *P. trinodis*.

***Pyxicephalus edulis*** Peters, 1854

**Distribution:** Kiffa (NICKEL, 2001), Bouli\*, Adel Bagrou (NICKEL, 2001), Chlim (NICKEL, 2001).

**Comments:** NICKEL (2001) reported this Afrotropical species for the first time. The



**FIGURE 7.** *Tomopterna cryptotis* (Boulenger, 1907) from Bou Blei'ine, Wilaya Assaba, Mauritania.

**FIGURA 7.** *Tomopterna cryptotis* (Boulenger, 1907) de Bou Blei'ine, Wilaya Assaba, Mauritania.

record from Bouli corresponds to a skull found by JMP in a hole of the trunk of a Baobab tree; it had probably been predated, since ardeid nests occupied the crown of the tree. The species was known in northern Senegal, where it had been found at Rosso, near the Mauritanian border (BÖHME *et al.*, 2001).

### *Tomopterna cryptotis* (Boulenger, 1907)

**Distribution:** Atar (DEKEYSER & VILLIERS, 1956), Bou Bleï'ine\* (Fig. 7), Guelta Oumm Lebare\*, near Aleg (MNCN, GENIEZ *et al.*, 2004), 35 km S of Ayoûn El Atroûss (GENIEZ *et al.*, 2004), near Ayoûn El Atroûss (BÖHME, 2000), Zoueina\*, Tamzakt (INEICH, 1997).

**Comments:** This species inhabits wetlands of the Sahel savannah in Mauritania (LE BERRE, 1989), but also relict populations can be found in wet areas of the Sahara region, such as the Adrar mountains (DEKEYSER & VILLIERS, 1956; GENIEZ *et al.*, 2004). INEICH (1997) reported the species in the southern coast of the country. The taxonomy of this species is still unclear, and the populations from Mauritania probably represent another species (W. Böhme, personal communication). BÖHME (2000) illustrated one specimen from near Ayoûn El Atroûss, and GENIEZ *et al.* (2004) illustrated one specimen from Guelta Schelcha and another from near Aleg.

## DISCUSSION

As seen in the previous list, knowledge of Mauritanian amphibian diversity has changed dramatically during the last few years, from the five species cited by LE BERRE (1989) and four by SALVADOR (1996), to the eleven species currently known. The seasonal climatic conditions of the Sahel savannahs in the south create habitats that amphibians find very suitable, and recent expeditions have

shown how diverse and still unknown much of the herpetofauna of this region really is; many Afrotropical species have been discovered in these regions (NICKEL, 2001, 2003; SHINE *et al.*, 2001; PADIAL, 2003, 2004).

In contrast, three quarters of Mauritania's territory is extremely arid, with temperatures among some of the highest in the Sahara (LE HOUÉROU, 1990). Habitat conditions in these areas are unsuitable for amphibians. Nevertheless, some species can survive in the Sahara (LAMBERT, 1984). Indeed, some species like *Bufo mauritanicus*, *Bufo brongersmai* and *Rana saharica* probably reached some areas of the central Sahara during the southward expansion of Mediterranean conditions. But in the oases from Mauritania only occur the Afrotropical species (*B. xeros*, *K. senegalensis*, *H. occipitalis*, and *T. cryptotis*) that survived since the last humid period pushed the forest and savannahs to the north before retreating again to the south (MALEY, 1996; BÖHME, 2000). In Mauritania these areas (mainly in the Adrar and Tagant mountains), are host to many animal and plant species that originally came from wet and dry savannahs (J.M. Padial, unpublished data). Moreover, there are still many isolated water sources in the Saharan region of Mauritania were the presence of amphibians is very likely. The conservation and study of these isolated and endangered populations is of special relevance.

The review of the literature concerning Mali and Senegal (BÖHME, 1978; JOGER, 1981; LAMOTTE & XAVIER, 1981; JOGER & LAMBERT, 1996), in addition to the recent discoveries of Afrotropical species in Mauritania, convinced us that other families, genera, and species have yet to be reported. For example, at Richard Toll (Senegal), a locality in the Senegal river near the

Mauritanian border, BÖHME (1978) reported several species that have not yet been reported in Mauritania. The species believed to occur in southern Mauritania are the following: Hemisotidae: *Hemisus marmoratus*; Hyperoliidae: *Afrixalus fulvovittatus*, *A. weidholzi*, *Hyperolius nitidulus*, *H. viridiflavus*, *Kassina cassinoides*, *K. fusca*, *Leptopelis bufonides*; Microhylidae: *Phrynomantis microps*; Pipidae: *Xenopus muelleri*; Ranidae: *Amniranana galamensis*, *Phrynobatrachus accraensis*, *P. francisci*, *P. latifrons*, *P. natalensis*, *Ptychadena floweri*, *P. oxyrhynchus*, *P. pumilio*, *P. schillukorum*, and *P. tellinii*.

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## APPENDIX I

## APÉNDICE I

Departments (Wilaya) and localities of amphibians of Mauritania. The numbers correspond to those shown in Fig. 1.

Departamentos (Wilaya) y localidades de los anfibios de Mauritania. Los números corresponden a los que aparecen en la Fig. 1.

Departments and Localities	Coordinates
Wilaya Adrar	
1. Atar	20° 31' N, 13° 03' W
2. Chinguetti	20° 27' N, 12° 22' W
3. Guelta Handoum	20° 20' N, 13° 30' W
4. Guelta Molomhar	20° 34' N, 13° 07' W
5. Iriji	20° 31' N, 13° 03' W (approx.)
6. Kanoal, Oued Séguelil	20° 18.216' N, 13° 11.837' W
7. Terjít	20° 15.578' N, 13° 05.854' W
Wilaya Assaba	
8. Bou Bleï'îne	17° 07.564' N, 10° 59.404' W
9. Bougari	16° 32.034' N, 10° 47.892' W
10. Foum El Cherat	16° 30' 35" N, 10° 49' 03" W
11. Guelta Oumm Lebare	16° 29.472' N, 10° 49.822' W
12. Kiffa	16° 36.850' N, 11° 24.930' W
13. Guelta Metraucha	16° 33' 48" N, 10° 45' 17" W
Wilaya Brakna	
14. Aleg	17° 3' N, 13° 55' W
Wilaya Gorgol	
15. Kaedi	16° 09' N, 13° 30' W
16. M'bout	16° 01' 41.8" N, 12° 34' 37.5" W
Wilaya Guidimaka	
17. Bouli	15° 18' 57.7" N, 11° 48' 00" W
Wilaya Hodh Ech Chargui	
18. Adel Bagrou	15° 55' N, 8° 02' W
19. Mahmûdé Lake	16° 29.969' N, 7° 42.91' W
Wilaya Hodh El Gharbi	
20. Ayoûn El Atroûs	16° 39' 41" N, 9° 37' 2.3" W
21. Chlim	16° 42' N, 9° 05' W
22. Zoueina	15° 42.689' N, 9° 39.906' W
Wilaya Tagant	
23. Guelta el Gheddiya	17° 50' 02" N, 11° 34' 36.6" W
24. Guelta Fanar	18° 0.951' N, 12° 10.498' W
25. Guelta Matmata	17° 53' N, 12° 07' W
Wilaya Trarza	
26. Chott Boul	16° 38' 00" N, 16° 26' 40" W
27. Dara	16° 36.323' N, 16° 7.969' W
28. Dar es Salam	16° 23' 26" N, 16° 31' 00" W
29. Tamzakt	17° 27' 48" N, 16° 09' 00" W
30. Rosso	16° 30.880' N, 15° 48.784' W
31. 20 km N of N'Diago	16° 26' 16" N, 16° 28' 00" W