

DISTRIBUTION AND STATUS OF BULWER'S PETREL (BULWERIA BULWERII JARDINE & SELBY, 1828) IN THE CANARY ISLANDS

By E. Hernández *, A. Martín *, M. Nogales *, V. Quilis *, G. Delgado ** and O. Trujillo ***

With 2 figures and 1 plate

SUMARIO. Como resultado de um estudo intensivo recente, a situação e distribuição da Alma Negra nas Ilhas Canárias foi revista.

A população desta espécie no Arquipélago foi estimada em cerca de mil pares nidificantes, distribuídos por mais de 35 colónias das quais as de Tenerife e dos Ilhéus de Lanzarote são as mais importantes, respectivamente com mais de um terço da população total e mais de 200 pares.

Alguns ninhos podem estar situados a certa distância da costa na medida em que, em diversas ocasiões, alguns exemplares ainda com penugem foram capturados bem no interior.

Os factores que ameaçam a espécie, na área estudada, são resultantes da introdução de ratos e gatos, bem como de actividades humanas e também a predação feita pelas Mantas (*Buteo buteo*) e Corújas (*Tyto alba*), que se tornaram especialistas na captura de pequenos Procellariiformes.

SUMMARY. As a result of recent intensive research, the status and distribution of Bulwer's Petrel in the Canary Islands has been revised.

The population of this species in the Archipelago has been estimated to comprise — approximately — one thousand breeding pairs spread throughout more than 35 different colonies of which, the most important ones correspond to those on Tenerife and the islets off Lanzarote. The former harbour more than a third of the total population and the latter in excess of 200 pairs.

In addition some nesting sites could be sited at quite a distance from the coast judging by the fact that on several occasions individuals, some even with remnants of down, have been captured well inland.

* Departamento de Zoología. Universidad de La Laguna. Tenerife. Islas Canarias. España.

** Museo Insular de Ciencias Naturales. Aptdo. Correos 853. 38080 Santa Cruz de Tenerife. Islas Canarias. España.

*** Jardín Botánico "Viera y Clavijo". Apdo. de Correos 14 Tarifa Alta. Las Palmas de Gran Canaria. España.

The factors threatening the species in the area studied are due to the introduction of rats and cats, as well as to several anthropogenic activities and to the incidence of natural predators such as the Buzzard (*Buteo buteo*) and the Barn Owl (*Tyto alba*), which have become specialists in the capture of small procellariiforms.

INTRODUCTION

The distribution range of Bulwer's Petrel is limited to the temperate and subtropical zones of the Atlantic and Pacific Oceans where it nests exclusively on small islands and islets situated between 10° S. and 40° N.

In the Pacific, it breeds over a wide area that includes various islands off the east coast of China and Taiwan (Melville, 1984), several islands to the south of Japan (Hasegawa, 1984), as well as the archipelagos of Hawaii, Bonin, Phoenix, Volcano, Marshall, Marquesas and Johnston's Atoll (Jouanin *et al.*, 1979). In the Atlantic, however, it is restricted to just a few enclaves on the Azores, Madeira, Salvages, Canary and Cape Verde Islands (Harrison, 1985).

In the Azores, Bulwer's Petrel has been recorded from the islands of Santa Maria, Graciosa and the small outer islets, but its current status is practically unknown. (Le Grand *et al.*, 1984).

On Madeira, Sarmento (1948) states that it breeds on Ponta de São Lourenço and more recently, Jepson and Zonfrillo (1988) have also found it on the Ilhéu de Fora, off the tip of the above mentioned promontory. Zonfrillo *et al.* (1986) have also recorded its presence on the Ilhéus de Cima and de Baixo (Porto Santo) estimating a breeding population of at least 1,020 pairs on the former and 2,700 on the latter. It is also very common on the Desertas (Lockley, 1952) and Salvage Islands (Le Grand *et al.*, *op. cit.*) although the size of the population is difficult to estimate.

Regarding the Cape Verdes, the species nests only on the islets of Razo and Cima, where Naurois (1969) estimates that 20-40 pairs exist.

In the Canaries very little information existed about this species until quite recently when it was possible to explore the coasts of the major islands as well as practically all the small islets, resulting in the discovery of new colonies and opportunities to survey those previously known more thoroughly.

MATERIAL AND METHODS

Various members of the Procellariiform Order pose severe difficulties when trying to detect and quantify their populations. The factors which give rise to this situation are the location of breeding colonies in inaccessible areas, hypogeal nesting sites and nocturnal activity when coming to land. Furthermore, in the particular case of Bulwer's Petrel, an additional difficulty is encountered due to the fact that this species is silent in flight.

During 1987 our team, consisting of six ornithologists, covered the potentially appropriate nesting areas of this species in the Archipelago.

Breeding colonies were located by direct observation of nests in those areas where the physical conditions of the terrain permitted access. This was supplemented by the use of mist nets in the more inaccessible areas. However the method of capture-recapture was never employed given the limitation of time and the generally low number of captures. The population estimates have mainly been derived from criteria formulated during the course of our five-year experience of intensive ringing on the Roques de Anaga (Tenerife).

RESULTS AND DISCUSSION

In the Canaries, Bulwer's Petrel nests principally on islets and less frequently amongst fallen rocks and boulders deposited on ledges or at the base of coastal cliffs on some of the main islands (Figure 1).

In addition, and although Zonfrillo (1988) states that this species has never been found nesting inland, we suspect that this may occur in the Archipelago due to the fact that some individuals have occasionally been captured at quite a distance from the coast (even at high altitudes).

A similar situation may also exist on the island of Madeira where Zino (pers. comm.) recently informed us of the capture of an individual in the mountains of the interior.

In the following paragraphs we present the results obtained during the study period for each one of the islands.

ALEGRANZA :

With respect to this islet the only references concerning Bulwer's Petrel date back to the last century. Webb *et al.* (1842) indicate that it is very common, as does Bolle (1855), who also states that it is captured in great numbers for human consumption. From then until the present time, the only evidence of the existence of the species relates to bird remains found in the pellets of *Tyto alba* (Martín, 1987).

During our visits to Alegranza, we had the opportunity to rediscover it nesting, though by no means in the same large numbers as long ago.

On 25th July 1987, two chicks were found on the south coast of the island (El Veril) and later, a further five, occupying nests, were located between El Bermejo and Callaito (northwest coast), where between the 28th and 30th of July, 81 individuals were mist netted. Furthermore, it is highly probable that nesting occurs in the area surrounding Punta Trabuco, where at least three birds were observed in flight and another inside a hole.

Other individuals could also be breeding at various sites in the interior and along the north coast, where remains of dead birds were found.

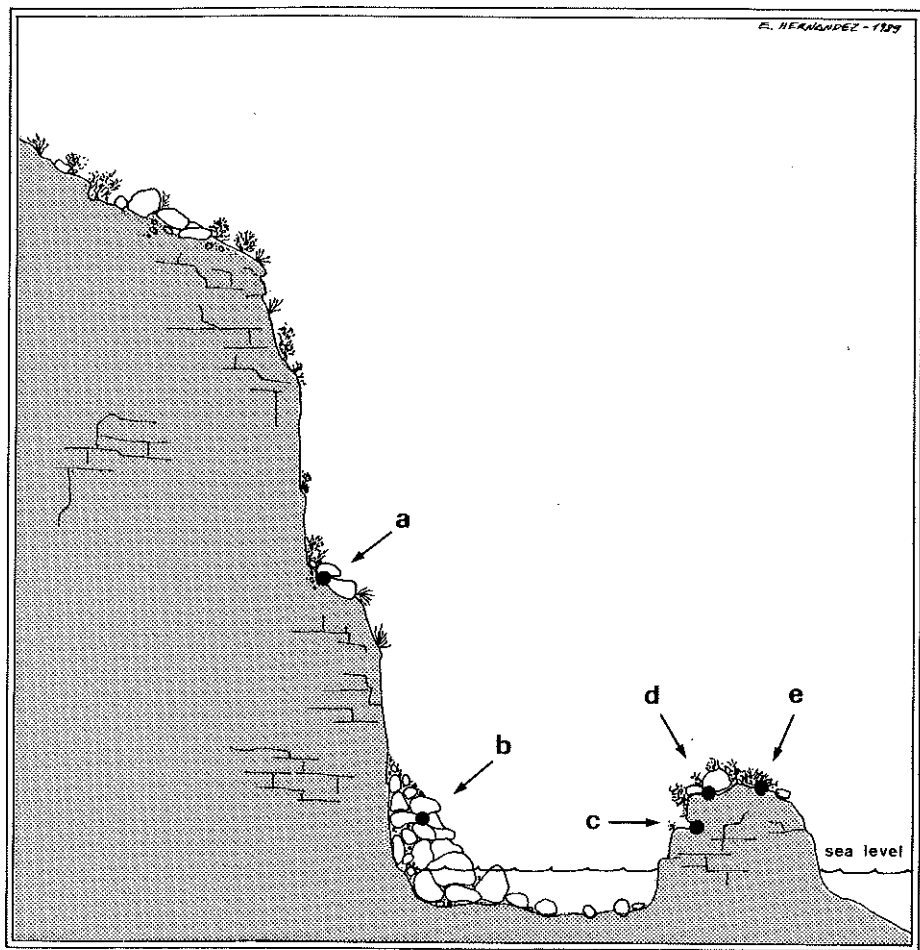


Fig. 1. — Normal nest locations of Bulwer's Petrel in the Canary Islands. a and b: under rocks and boulders on small ledges and at the base of coastal cliffs. c, d and e: inside cracks, under rocks or amongst dense vegetation on islets.

Due to the fact that the majority of the nests are situated amongst rock debris at the base of cliffs where it is practically impossible to make an accurate count, it is very difficult to know the true size of the population. Nevertheless, as a first approximation, the figure of 75-100 pairs is a reasonable estimate.

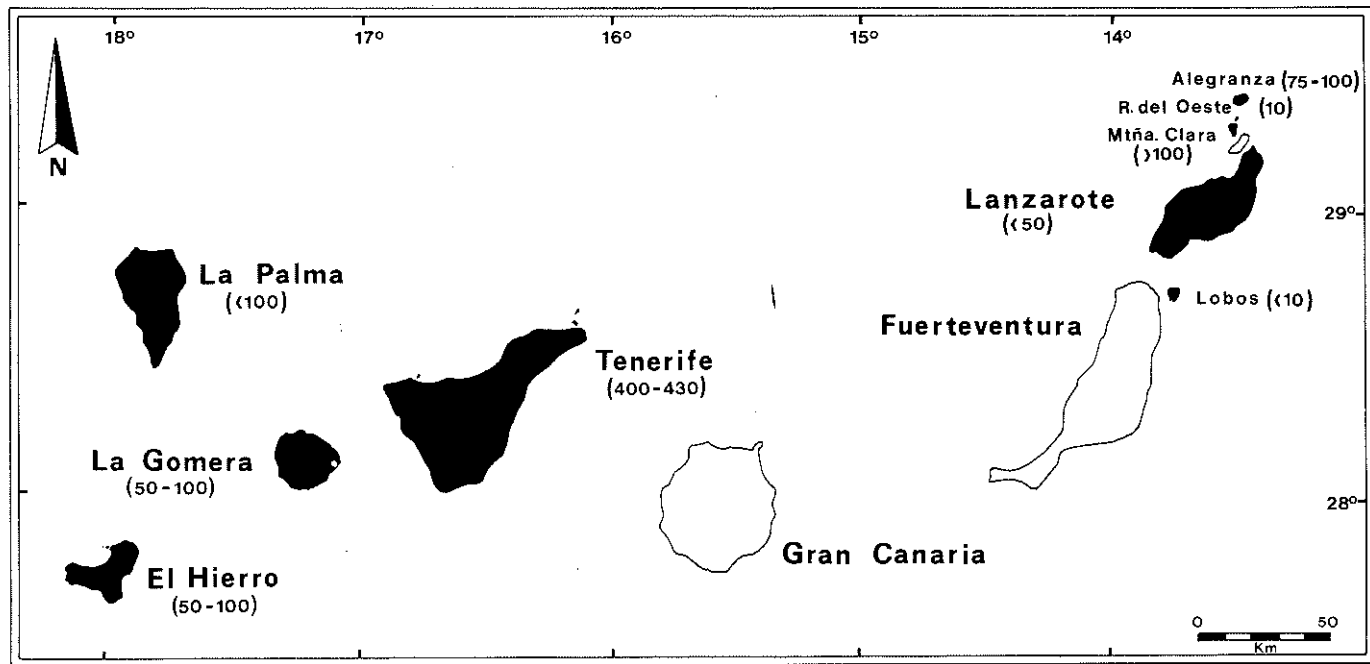


Fig.2.—Distribution of Bulwer's Petrel in the Canary Islands (the figures in brackets refer to the estimated number of pairs).

ROQUE DEL OESTE :

On 21st July 1987, five occupied nests were found and, judging by the scarceness of appropriate nesting sites, we calculate that there are no more than ten pairs.

This is the first record of Bulwer's Petrel on this small islet. Bannerman (1914), possibly the only ornithologist that was able to land on this stack, only discovered Cory's Shearwater (*Calonectris diomedea*) breeding.

MONTAÑA CLARA :

The breeding areas are mainly located on the south coast, as well as in the interior of La Caldera (a crater which has been semi-dismantled by marine erosion).

Although most of the nests were in crevices or under rocks, it is interesting to note that some birds utilize burrows excavated in sandy soil by *Pelagodroma marina*, a species which has recently been discovered in the Archipelago (Martín *et al.*, 1989).

Bulwer's Petrel has been known to breed on Montaña Clara since the beginning of this century when Bannerman (1914) found it in abundance. Later, Lovegrove (1971) estimated that there were 100 nesting pairs on the islet. However, in our opinion, the sum of all the colonies on Montaña Clara could be slightly above this figure.

LANZAROTE :

Six burrows situated under blocks were located on the coast between Piedra Vieja and Caleta Negra, in the S'W of the island, though it was impossible to inspect them. During the night of 5th August 1987, four birds were seen circling the area, another was heard inside a burrow and remains of down were found in a nest.

Furthermore, Concepción (in prep.) has recently confirmed that the species breeds in the Timanfaya National Park, having found on several occasions dead chicks and adults as well as a well grown live chick on 23rd August 1988. Some birds have also been detected during the nesting season near Playa Quemada (SE coast), Caletón Blanco (Orzola) and Playa de Teneza (North of Tinajo).

The population on Lanzarote must be quite low (perhaps fewer than 50 pairs) and due to predation by rats and cats, together with the spectacular touristic development, will probably become extinct within the very near future.

LOBOS :

The reproduction of Bulwer's Petrel on this island has been confirmed for the first time with the finding on 4th August 1987 of an almost completely fledged chick in a hole situated in the upper part of La Caldera (a 127 m. high volcanic cone). Although another individual was

observed flying near la Playa del Sobrado, it seems that this species is extremely rare there.

GRAN CANARIA :

The only sighting made refers to an individual observed in flight about two miles off the north coast. However, according to the statement of a local fisherman, a small colony formerly existed near Playa de Mogán (SW) but was destroyed by domestic cats about 40 years ago. (1)

TENERIFE :

There are various old references alluding to the presence of Bulwer's Petrel on this island. Serra y Moratin (1880) cite it from the Roques de Anaga, while Meade-Waldo (1889) states that it commonly breeds under rocks and in holes at the base of the cliffs in La Victoria and Santa Ursula on the north coast. More recently, Wink (1975) mentions that he found an egg near Punta de Rasca, in the extreme south of the island.

Following years of intensive ringing on several rocky islets off the coast of Tenerife the data we obtained show that the island harbours the largest population of Bulwer's Petrel in the Archipelago (between 400 and 430 breeding pairs), concentrated principally on the two Roques de Anaga (300 pairs approximately), while the remainder is found dispersed on a series of small rock stacks off the north coast: Roque de Garachico with 40-50 pairs, Roques de San Juan de La Rambla, La Coronela (Icod), and Santa Ursula, with 15-20 pairs on each, and finally a small stack off the coast of El Sauzal where 10-15 pairs breed.

Nesting may also occur at other diverse localities, such as the coastal cliffs of Santa Ursula (La Rapadura), where feathers and egg shells were found on 2nd March 1984, or even in the interior of the island, considering the fact that Koenig (1890) mentions a female which was captured in Vilaflor at an altitude of 1,400 m., while another specimen was found on 23rd July 1987 15 km. inland at Madre del Agua (Granadilla), 1,800 m. a.s.l. Martín (1987) also mentions the finding of a dead bird at Realejo Bajo (1,300 a.s.l.) and another in Barranco Hondo (400 a.s.l.). While finally, Barrera (pers. comm.) captured a fledgling on 30th September 1985 near El Tanque at an altitude of 1,300 m.

LA GOMERA :

Nesting of Bulwer's Petrel on this island was confirmed for the first time with the finding of several small discrete colonies along the south coast.

With the exception of Roque de Iguala (visited on 15th September, 1987) where 5-10 pairs are breeding, the remaining colonies are invariably

(1) ADDENDA : When this paper was still in press, two fully fledged chicks were found wrecked on the 18th and 20th September 1989 in Puerto de Mogán and consequently, a breeding colony could still exist in the nearby vicinity.

located amongst fallen rocks and boulders at the base of the cliffs or on small ledges, almost always inaccessible except by boat.

The locality which offers optimum nesting conditions is situated on the coast close to Playa Santiago (El Aguila-Baja del Guañe) where, on 19th September 1987, the remains of down and egg shells were found at 18 sites and the presence of 20-30 pairs is presumed. On that same day in a nearby rock fall (Los Manaderos), three holes and a fledgling were found, while five small holes and a dead chick were observed at Punta de Erese.

Furthermore, at Las Puntas de Juan Daza, La Jarrita and La Dama, the remains of birds devoured by cats or rats were found.

The total population on La Gomera can be estimated to comprise between 50-100 pairs.

EL HIERRO :

The most important colony is located on Roque Grande de Salmor where probably 25-50 pairs breed. This area has already been mentioned by Martín and Hernández (1985).

The remaining breeding areas harbour small populations (less than 10 pairs in each case). Worthy of special mention are Roque de las Gaviotas on the northeast coast, Roques de las Palomas in the north and several small stacks off the northwest coast (Roques del Arco de la Tosca, La Hoya and Gutiérrez).

Additionally, breeding may occur on the main island judging from the bird remains found near Malpaís del Tamaduste, Lomo Negro and Risco de los Negros.

The total island population could comprise between 50-100 pairs.

LA PALMA :

Until now, Bulwer's Petrel was not known to breed on this island. However, we have confirmed the existence of two small populations on two rock islets: Roque Negro (Los Sauces) and Roque de San Antonio (Garafia). On the former, 33 nests were counted on 15th August 1987 and the population is estimated at between 40-50 pairs concentrated in an area less than 200 m² while on the latter, 15-20 pairs were breeding.

The possibility also exists that some pairs nest on Roque del Guincho (Garafia) and to the south of Playa de Nogales, where excrement was noted together with the characteristic smell associated with the breeding grounds.

The population of *Bulweria bulwerii* on La Palma probably does not exceed 100 pairs.

In short, all the above information clearly reflects that the distribution of Bulwer's Petrel in the Canaries is very fragmented, as shown by

the fact that more than 35 colonies have been detected spread throughout the islands.

Taken as a whole, these populations total approximately 1,000 breeding pairs. In general terms they can be grouped into two numerically significant groups: the most important one comprising the rock stacks off the north coast of Tenerife where 1/3 of the total population is located, and being followed by the islets off Lanzarote with a population in excess of 200 nesting pairs.

However, it is most likely that these figures only correspond to a small fraction of the original population since, at least in one case, we have confirmed the disappearance of a colony mentioned in the bibliography, concretely in the base of the cliffs near Puerto de la Cruz (Tenerife), where Meade-Waldo (*op. cit.*) found the species nesting under rocks and in holes. Additionally, numbers seem to have diminished notably on the island of Alegranza since the middle of the last century judging by the comments of Bolle (*op. cit.*).

THREATS

The reasons for the regression of Bulwer's Petrel in the Canary Islands are fundamentally due to the effect of predation by rats (*Rattus* sp.) and feral cats (*Felis catus*), species that were probably introduced during the Conquest (15th century) or even quite recently in the case of some islets. This explains why the most important breeding colonies are currently located on islets or in appropriate areas of the coastal cliffs of the main islands where the degree of isolation is often comparable to that of the former (categories *a* and *b* of Figure 1).

Furthermore, certain activities of anthropogenic origin such as camping on the very small islets, normally produce a certain degree of change in the environment which can have devastating consequences for some populations. For example, on the largest of Los Roques de San Juan de La Rambla (Tenerife), we have observed a considerable reduction in the number of nesting pairs of Bulwer's Petrel, dwindling from 15-20 pairs in 1984 to only 1 pair in 1986, most probably as a consequence of the fact that campfires are customarily very close to the nesting area. A somewhat similar situation is to be found on Roque de Garachico where every year a fireworks display takes place directly above the central breeding area although at the present time we lack specific data indicating the degree of harm done.

In addition until quite recently on Los Roques de Anaga, it was customary to take chicks from the nests to be used as fishing bait.

Finally, mention should be made of the effect that natural predators have on the small colonies, especially birds of prey such as the Buzzard (*Buteo buteo*) and the Barn Owl (*Tyto alba*) which become specialists in the capture of small procellariiforms. The Buzzards are notorious for their hunting on the Roques de Anaga and Garachico, where on many occasions

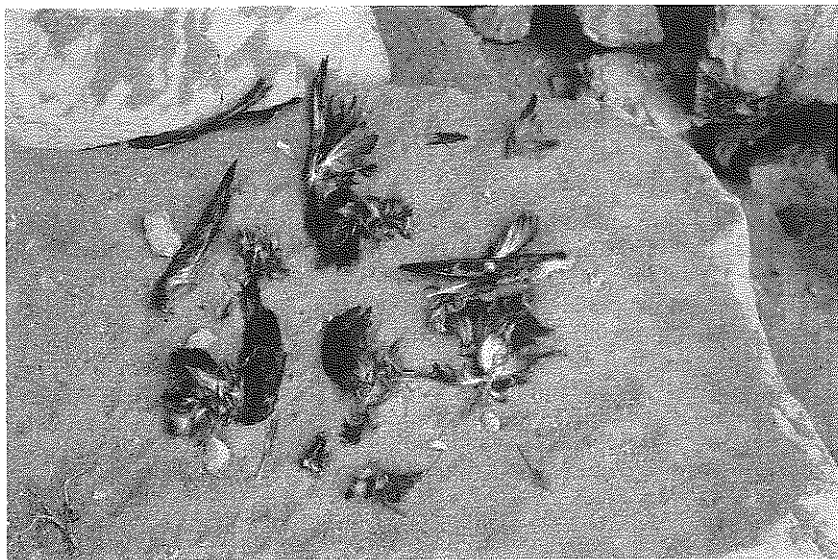


Plate 1. — Bulwer's Petrels dismembered by predators. Above, full-grown chicks devoured by rats. (Photo from the Zoology Department). Below, adult specimen partially eaten by feral or domestic cat. (Photo by R. Barone).

we have found plucked petrels (including chicks) and the remains of others in the pellets.

Also, on Roque de Santa Ursula (Tenerife), the permanent nesting location of approximately 20 pairs of *B. bulwerii*, on 9th September 1983 we found the remains of 11 birds devoured by *Tyto alba*.

ACKNOWLEDGEMENTS

This account forms part of a more extensive research project entitled "Distribution and Status of the breeding seabirds in the Canary Archipelago with the aim of providing conservation strategies", which was totally financed by the Dirección General del Medio Ambiente (Gobierno de Canarias), to whom we would like to express our most sincere gratitude.

We would also like to thank Dr. F. Zino (Madeira) and Mr. Domingo Concepción García for providing very helpful and important information.

BIBLIOGRAPHY

Bannerman, D. A.:

1914. The distribution and nidification of the Tubinares in the North Atlantic Islands. *Ibis*, 10:438-494.

Bolle, C.:

1855. Bemerkungen über die Vögel der Canarischen Inseln. *J. Orn.*, 3:171-181.

Concepción, D.:

- (in prep.) La avifauna del Parque Nacional de Timanfaya (Lanzarote).

Harrison, P.:

1985. Seabirds. An identification guide. Croom Helm Ltd, London. 2nd Ed., 448 pp..

Hasegawa, H.:

1984. Status and conservation of seabirds in Japan with special attention to the Short-Tailed Albatross. In: Croxall *et al.* (Eds.). ICBP, Technical Publication, 2:487-500.

Jepson, P. R. and B. Zonfrillo:

1988. Bird notes from Madeira, summer 1986. *Bocagiana* 117:1-10.

Jouanin, J.; L. Mougin; F. Roux and A. Zino:

1979. Le Pétrel de Bulwer *Bulweria bulwerii* dans l'Archipel de Madère et aux îles Selvagens. *L'Oiseau et R. F. O.*, 49(3):165-184.

Koenig, A.:

1890. Ornithologische Forschungsergebnisse einer Reise nach Madeira und den Kanarischen Inseln. *J. Orn.*, 38:257-488.

Le Grand, G., K. Emmerson and A. Martín:

1984. The Status and Conservation of Seabirds in the Macaronesian Islands. In: Croxall *et al.* (Eds.). ICBP, Technical Publication, 2:377-391.

Lockley, R. M.:

1952. Notes on the Birds of the Islands of the Berlengas (Portugal), the Desertas and Baixo (Madeira) and the Salvajes. *Ibis*, 94:144-157.

Lovegrove, R.:

1971. B.O.U. supported expedition to northeast Canary Islands. *Ibis*, 113:269-272.

Martín, A.:

1987. Atlas de las aves nidificantes en la Isla de Tenerife. *Inst. Est. Can. Monograf.* XXXII. 275 pp..

Martín, A. and E. Hernández:

1985. Importante colonia de aves marinas en los Roques de Salmor (Isla del Hierro Canarias). *Ardeola*, 32:123-127.

Martín, A.; G. Delgado; M. Nogales; V. Quilis; O. Trujillo; E. Hernández and F. Santana:

1989. Premières données sur la nidification du Puffin des Anglais (*Puffinus puffinus*), du Pétrel Frégate (*Pelagodroma marina*) et de la Sterne de Dougall (*Sterna dougallii*) aux îles Canaries. *L'Oiseau et R.F.O.*, 59(1):73-83.

Meade-Waldo, E. G. B.:

1889. Further notes on the birds of the Canary Islands. *Ibis*, 6:503-520.

Melville, D. S.:

1984. Seabirds of China and the surrounding seas. in: Croxall *et al.* (Eds.). ICBP, Technical Publication, 2:501-511.

Naurois, R.:

1969. Notes breves sur L'Avifauna de L'Archipel du Cap-Vert. Faunistique, endemisme, ecologie. *Bull. de l'I. F. A. N.*, 31:143-218.

Sarmiento, A.:

1948. Vertebrados da Madeira (Mamíferos, aves, répteis, batráquios). Junta do Distrito Autón. do Funchal. 2nd Ed..

Serra y Moratin, L.:

1880. Ornitología Canaria III. *Revista de Canarias*, 36:154-156.

Webb, P. B.; S. Berthelot and M. A. Moquin-Tandon:

1842. Ornithologie canarienne. in: *Histoire Naturelle des îles Canaries*. Tomo 2, Vol. X: 1-48 Bethune Ed. Paris.

Wink, M.:

1975. Eifund der Bulwersturmschwalbe *Bulweria bulwerii* auf Teneriffa. *J. Orn.*, 116: 489-490.

Zonfrillo, B.:

1988. Notes and comments on the taxonomy of Jouanin's Petrel *Bulweria fallax* and Bulwer's Petrel *Bulweria bulwerii*. *Bull. B. O. C.*: 108(2):71-75.

Zonfrillo, B.; M. J. Jones and L. A. Lace:

1986. Notes on birds observed on the Porto Santo Islands in September, 1984. *Bocagiana* 91:1-4.