

Tourism and Biodiversity: the Balearic experience

Cristian Ruiz Altaba & Lina Ponsell

Dr Cristian Ruiz Altaba, Institut Mediterrani d'Estudis Avançats (CSIC-UIB), Ctra. de Valldemossa Km 7.5, 07071 Palma de Mallorca (Illes Balears, Spain). Email: ieacra4@clust.uib.es

Catalina Ponsell Vicens, IES Josep Maria Llompart, Pedagog Joan Capó 2, 07015 Palma de Mallorca (Illes Balears, Spain). Email: iesjml@retemail.es

The wave of tourism

Tourism is a quite recent and rapidly growing impact on many island ecosystems. One of the major concerns about this novelty is the variety and strength of its effects on the biodiversity of such small territories. The sustainability of tourism depends largely on its ability to become host-friendly and conservation-minded. And in turn, the fate of biodiversity in areas under tourist pressure is contingent upon its recognition and appraisal.

There have been excellent breakthroughs in this area (e.g. Edington & Edington 1986; Eckert & Cremer 1997), and eco-tourism is a flourishing, albeit still quite a minority novelty, in many places (e.g. Castroviejo & Herrero 1992). Yet, the fact is that tourist developers and managers mostly look at landscapes and beaches as products on sale, while tourists themselves appear largely as a nuisance to be ignored by most naturalists. As a result, the vast majority of research papers or essays on either tourism or biodiversity (even in tourist destinations) make little or no serious mention of each other.

Therefore, it might be useful to focus on a case where tourism has a long history and, having reached its zenith as a sustainable industry, is now seeking to survive in a competitive, environmentally conscious area. The Balearic Islands have been a well-known tourist destination for at least fifty years. The enormous changes that the tourist industry has triggered in Balearic society have come a long way from the problems of poverty and emigration to those of opulence and immigration. In terms of biodiversity conservation, some problems have been solved by changes in habits and land use, but many others have appeared along with demographic, economic, and urban growth (Picornell 1991; Mayol & Machado 1992).

Tourists exert a huge pressure on the islands' nature. This is already feeding back on tourism itself. Thus, there is a need for a new model of development aimed at sustainability. In order to develop such a model in every instance we need first to understand the particular biological history of each island. Together with factual documentation on tourism, it may then be

possible to foresee ways of putting this new factor into a reasonable, tailored formula.

Splendid biodiversity

The Balearic Islands are home for an extraordinary and unique biodiversity. Such richness is largely due to the fact that they are the most isolated archipelago in the Mediterranean. Moreover, the Mediterranean region, formed by the complex collision of several tectonic plates, hosts one of the highest concentration of species, and one of the largest proportions of restricted-range endemisms (Cody 1986; Oosterbroek 1994; de Jong 1998; Altaba 1999, in press b). The Balearics, known world wide as an emporium of the tourism industry, are something more than a nice scenario for publicity images – and for the naturalist, much more so.

The flora and fauna of the Balearics contains many endemics, often limited to a quite small part of the archipelago's territory. A rugged geography, with more than a hundred islets large enough to host terrestrial ecosystems, and an abrupt orography, with mountaintop zones very different from shoreline environments, add a variety of habitats favouring diversification. However, the study of autochthonous biodiversity is still insufficient, because there are groups having received little or no attention – and may be more worrisome, because species identification has traditionally suffered from a bias towards Iberian fauna and flora.

In almost every islet there are particular varieties of lizards, land snails and non-flying beetles (e.g. Alcover *et al.* 1993). These populations have no chance of gene exchange, and have been isolated since the sea level rose at the end of the last glaciation. Some beetles are considered distinct species, but differences in size among populations inhabiting different islets have not deserved recognition as subspecies. In the case of lizards, a lot of subspecies are accepted, endemic to one or two close islets. In contrast, snails have in general not received nomenclatural recognition, even in cases of quite obvious diagnostic differences.



Figure 1 (A to D, from top). The natural vegetation of the Balearics consists mostly of various types of garrigue. At the northernmost tip of Mallorca, large expanses of “càrritx” *Amphelodesmos mauretanica* alternate with Aleppo pine *Pinus halepensis* woods (A), together with stands of small palms known as “garballons” *Chamaerops humilis*. In the highest parts of the mountain ranges (B) there are communities formed mostly by species endemic to such heights, adapted to an extreme climate. Human activity, transforming island nature over many centuries, becomes evident in the habitat mosaic of Menorca (C), including pastures and cultivated fields among more or less interconnected trimmings of forests and garrigues. Peripheral islets, such as those known as Vedrà and Vedranell and lying to the south-west of Eivissa (D), host endemics belonging to several groups of organisms unable to breach the channels isolating them. Even though they are strictly protected, all such islets have been subjected to tremendous aggressions, rendering their terrestrial ecosystems different from what they would have been before the arrival of humans.

Extending this overview to plants, further anomalies emerge (Alomar *et al.* 1997). For example, the vine *Rubia angustifolia* is endemic to the Balearics, and is not rare in the tiny island of Cabrera. There lives also another plant, similar but growing as a herb and only in a very small area swept by storms. No hybrids are known between the two forms, and their characteristic morphology does not seem affected by cultivation side by side in botanical gardens. Surprisingly, botanical tradition stands heavily enough as to make the latter to be recognized at most at the level of “subspecies” – *Rubia angustifolia* subsp. *caespitosa*.

In some instances at least, it is clear that such insular taxa merit species status, because they have undergone a long evolutionary history in isolation and have not interbred with continental taxa for an extended period. Among birds, the Balearic shearwater *Puffinus mauretanicus*, the Mallorcan crossbill *Loxia curvirostra* and the Balearic warbler *Sylvia balearica* must be considered as valid species – not by applying innovative or debatable species concepts, nor due only to important morphological differences, but after considering evidence on their distribution, behaviour and fossil record (Altaba 1994, 1999). The discovery of endemism among birds highlights how little we really know about biodiversity in the Balearics, or in the Mediterranean at large.

A wreck’s environmental history

The origin of the native Balearic biota dates back from the late Oligocene, some 30 million years ago

(Cardona 1979; Altaba 1998; de Jong 1998). At that time, the emerged land-mass that would eventually become the Balearic Archipelago detached from Sardinia and adjacent lands, starting evolution in isolation of the species living there. The only later connection to the nearby continents took place during the Middle Miocene (in the Serravallian, some 14 million years ago), when the formation of the Arc of Gibraltar involved the Balearic Promontory, giving it a form close to the present one. This connection was relatively brief, although it allowed the arrival of a few terrestrial vertebrates (Altaba 1997).

ago). This hypothesis was intended to explain the saline deposits in the bottom of the basin, and has extended a powerful influence in biogeographic studies. Yet, from a strictly geological point of view, it is quite unclear whether the Mediterranean dried up. And concerning its biogeographic implications, it does not seem it had any noticeable effect on the terrestrial fauna and flora, not only in the Balearics, but throughout the whole basin (Altaba 1998). These facts notwithstanding, it is an idea that has been advocated to explain all sorts of distributions around the Mare Nostrum.

Later on, an undoubtedly important episode happened, still dated with little precision sometime in the Lower Pleistocene: a mass extinction, perhaps caused by a submarine volcanic eruption, triggering a dramatic reduction in the number of insular species, especially in the southern island group (the Pytiusics). Many species of land snails, in addition to lizards, a giant tortoise, an artiodactyl, and a dormouse appear in Plio-Pleistocene sediments. And then, in younger sites, only a few snails and the Pytiusic lizard are to be found. Thus, the islands of Eivissa (Ibiza) and Formentera were quite similar in their ecology to oceanic islands, e.g. those never having been united to continents. This makes them an anomaly of utmost interest in the Mediterranean context (Paul & Altaba 1992; Alcover *et al.* 1994).

Finally, climatic and sea level fluctuations throughout the Quaternary furnished ample opportunities for the evolution of a remarkable biota. Several instances of highly restricted endemism (in islets, mountaintops, isolated swamps, caves and remote cliffs) can be accounted for in this manner.

Human settlement of the Balearics, dating only some 5,000 years ago, represented a cataclysm. In the first place, enormous changes in vegetation were produced (Yll *et al.* 1997). As in other islands worldwide, centuries of such changes brought the introduction of an impressive array of invasive species. Most of these exotics probably arrived through an "invasion corridor" from the area around Sicily, from where merchant Greek and Carthaginian ships sailed to commerce with the aboriginal Balearics (Altaba 2000a). The final result is that the Balearic biota has been deeply altered. Indeed, all present-day terrestrial mammals are newcomers, while those endemic were exterminated by human causes. Such pattern is equivalent to what happened in all Mediterranean islands (excepting the Pytiusics). Of the original insular mammal fauna, only two shrews remain (in Crete and Malta). Birds probably suffered a comparable disaster, even though it is difficult to evaluate its extent because there are still many unresolved issues in the taxonomy of pre-human species in the whole Mediterranean region.



Figure 2 (A to C from top). The Balearic fauna includes many endemic species. The examples shown here are a blind cave-dwelling crustacean known from a few sites (*Typhlocirolana moraguesi*, A), a land snail restricted to the high mountains (*Iberellus balearicus*, B), and a lizard found only in one islet (*Podarcis pytiusensis vedranellensis*, C).

It is worth pointing out here the debate around the purported desiccation of the Mediterranean at the end of the Miocene (in the Messinian, 5.5 million years



Figure 3 (A to B from top). The native herbivore of the northern Balearics was a small caprine, called *Myotragus balearicus*. Virtually free of predators (only eagles could prey on it), it must have exerted an intense pressure on vegetation. It became extinct shortly after the arrival of humans to these last unsettled islands in the Mediterranean. Today we find its remains in caves, and also in the peculiarities of the endemic flora. The extremely toxic “didalera” (*Digitalis minor*, A) is one of the few non-endangered natives, thriving even in areas with a high density of feral goats. Other plants have mechanical defences, such as the amazingly thorny “socarrell gros” (*Anthyllis hystrix*, B), which often exhibits the effect of northerly winds in its shape and position of live parts.

Among insular species, many have survived devastation of original ecosystems thanks to the existence of unexpected refugia, where habitat conditions are often only marginally adequate. This is the case of New Zealand’s tuatara, Guadalupe’s native flora, or Mauritius’ monsoon forests, all of which still hang out in tiny peripheral islets. This is also the case

of native lizards in the northern Balearics (or Gymnesics), and of some endemic plants scattered across the whole archipelago (Altaba in press b). Another surprising example is provided by the Mallorcan midwife toad *Alytes muletensis*, first known from subfossil remains, and later found living in some remote mountain streams (Hemmer & Alcover 1984).

Island vertebrates underwent an almost complete extinction, but this collapse did not affect other groups of organisms, at least not to a comparable degree (Altaba 1999, in press b). Even though the number of introduced land snail species is very large, it does not appear that any extinction has taken place among the Mediterranean island fauna. Land snails and plants have comparable patterns of endemism, yet only the former leave a good fossil record. However, it is also true that no extinctions have been recorded among endemic plants. (The only known loss is *Lysimachia minoricensis*, which survives in botanical gardens after disappearing from the wild well within the 20th century.)

In order to understand this exceedingly low (or null) extinction rate among plants and land snails, it is necessary to rewind Balearic history to grasp how a previous “extinction filter” (Balmford 1996) had already affected these taxa. The profusion of thorns and toxins among plants endemic to Mediterranean islands suggests indeed that they evolved under a selection imposed by a very intense herbivory pressure by endemic ungulates roaming virtually free of predator control. Therefore, the substitution of domestic or feral livestock (such as goats in Mallorca; Altaba 2000b) for those ungulates meant no havoc, in contrast with what happened in many oceanic islands lacking herbivores where plants had no defence.

There is thus no evidence suggesting a great extinction among Balearic (or Mediterranean) native plants (Greuter 1994) taking place before the existence of botanical records. Instead, there is much favouring the alternative that plants (and land snails as well) remained largely unaffected by traditional, extensive land uses. Therefore, the outcome in this particular context is that much of the original biodiversity still exists, although most of the endemics’ ranges have become even more restricted, and thus more dependent on a fine-grained pattern of land use. In the last quarter century, however, changes in those uses have occurred with unprecedented magnitude and speed, putting now many species in critical danger (Altaba 1999, in press a; Bestard *et al.* 2000)

Tourism on a fragile land

Following a few millenia of human occupation, the Balearics have become a complex mosaic of habitats largely affected by the activities of our species. After a

resident population of the Balearic Archipelago is close to 800,000. Nearly 60% of these live in the metropolitan area of Palma, where most political, industrial, commercial and financial activities are concentrated. The parallel increase of tourism has promoted a conspicuous economic progress (Mayol & Machado 1992; Manera *et al.* 1999; Conselleria de Turisme 2000).

As a result, the per capita income stands as the highest in Spain. In 1999, the three airports received 19.2 million passengers, while the main harbours registered 2.2 million. That same year, the islands were visited by 10.7 million tourists, occupying 405,000 beds and 256,000 restaurant seats. This generated a gross income around 916 billion pesetas (ca. 5.5 million euros). Unquestionably, the Balearics are a leader in vacational tourism. The tourist sector is highly sophisticated, and is also a leader in the development of other tourist destinations worldwide.

There are, however, negative aspects to all this development. Indeed, the massive destruction of the coastline has yielded the term "Balearization". Domestic refuse production is twice Spain's average. With nearly 900 cars per 1000 residents, traffic has become a nightmare. The mean level of water tables has fallen 90 m in 15 years, and aquifers lie at a mere 7% of their capacity. Electrical consumption rose 37% between 1993 and 1998. Air pollution in Palma is twice that of Madrid. All together, the "ecological footprint" is equivalent to that of a much larger population on an enormously wider territory. And these problems are appreciated by tourists: 34% of all their queries relate to environmental questions.

Those queries are indeed taken seriously, because current wealth is based mostly on tourism: 84% of the Balearic GNP is related to it. And it is widely acknowledged that the vagaries of tourism may not be predictable. On a yearly basis, it is a fact that the fraction of hotel rooms occupied fluctuates drastically: while it is at least 97% in August, it falls to a mere 12% in December. This variation is responsible for much temporary unemployment. In addition, income is quite unevenly distributed, making the Balearic poverty ratio stand among the highest in the European Union. Even if the gross economic figures may look satisfactory, there is a growing concern about environmental issues (Verd 2000).

All this happens on a territory that provides huge incomes but receives little investment from the Spanish central government. For example, roads are just 67% of Spain's average per inhabitant, and the proportion of university students stands at half. Although if new investments are to be in the form of plans elaborated by the Spanish Environment Ministry, it may be better to avoid them; they appear



Figure 4. Preserving the remaining natural habitats, such as Cape Cavalleria in Menorca (the northernmost tip of the Balearic archipelago), depends upon finding a win-win solution for both the conservation of endemic communities and the public use of these lands. Tourism can easily be a disturbing impact, yet with careful planning it can promote the successful, albeit complex management of protected areas.

to aim at paving the whole coastline and transforming protected areas into a perpetual display.

Keeping Paradise afloat

Much, perhaps most, of the natural heritage of the Balearic Islands is currently endangered. Most endemics survive only where there are less human-induced perturbations, and thus fewer exotics (Pretus & Chust 2001). The biological richness surviving in the still little altered landscape cut-offs deserves to be protected with exquisite dedication.

There are sound scientific reasons for conservation in such small and impacted territories. Also, and perhaps in a more important way, deep ethical motivations exist. In addition, an economy based on the two pillars of entertainment and information should constitute sufficient grounds not to spare any efforts.

The current economics might render these islands an advance of what human impact is causing everywhere: with an extremely high, and growing energy consumption, and with an accelerated occupation of the territory with no equilibria, they are years ahead of what ought to happen elsewhere.

A clear sign of the current situation was recently in the local news. The first publicized draft of an ambitious Territorial Plan for Mallorca included a firm proposal to "ameliorate" the island's nature. This was to be performed through the introduction of several species that have never existed there, including beech, roe deer... even Spanish lynx! A storm of criticisms and jokes (e.g. Perelló 2001) elicited the following response from the surroundings of the Council of Mallorca's presidency: "that was simply the pre-diagnosis, not even a diagnosis previous to the Plan's development" (Artigues 2001). With such reasoning, it becomes clear that the island's biodiversity is still far from understood or appreciated in certain relevant quarters.

Yet, there are reasons for hope. After many years of modest or dubious environmental action, the Government of the Balearic Islands is now ruled by a left-centre coalition whose goals include explicitly conservation and sustainability. Most interestingly, the Department of the Environment is now in the hands of the Greens, and several relevant steps are being taken (Conselleria de Medi Ambient 2001). Resource use and traffic are being rationalized, recycling and waste reduction is incentivized, and water demand is starting to be managed. A comprehensive Biodiversity Law is now almost ready to go through the Parliament of the Balearic Islands, and an extensive network of nature reserves is being developed. Most noticeably, environmental education is taking off with impetus (Bestard *et al.* 2000).

Putting tourists into the equation

There is an urgent need for finding a model of sustainable development in the whole Mediterranean region (Mooney 1988; Bifani 1999). It must be kept in mind that the current bonanza for the Balearic economy has been the outcome of various crises affecting potential competitors. The bet is now for a more varied, more even and more recognized tourist offer. This is to be achieved through action along two paths: giving an explicit value to natural areas, and tuning tourist zones.

The tourist industry, even if hostile to anything that might imply less than cost-cutting, is drifting towards a general "greening", pushed by market forces putting a value on environmental matters (Picornell Vaquer 1999). On the part of the Government of the Balearic Islands, there is an innovative programme, called

"Ecotur", aimed at helping tourism companies along this path (Chacártegui Cirerol 1999). The risk, of course, consists of putting on too much make-up, to the point of achieving the disguise of truly "Balearized" townships (such as Calvià; see Eckert & Cremer 1997) as environmentally friendly places.

The enormous cost of a serious "greening" plan requires additional financial resources, which ought to be produced largely by the tourism industry itself. On 10th April 2001, the ecotax has finally been approved in the Parliament of the Balearic Islands, with the applause of the majority, widespread and eloquent support among residents and tourists, and the acrimonious promise of legal battles on the part of witnessing hotel owners and of the Spanish central government (Payeras 2001).

The Balearics now support a very complex society, which is starting to make sophisticated evaluations in order to make careful choices for the future. Biodiversity is already deeply rooted in most people's view of the islands they inhabit (Ginés Gràcia 1999). Public participation in decision-making is a fundamental issue, requiring large doses of environmental education focused on the reality of the islands' resources and problems. Tourists also can and should be taught, instead of being driven merely as valuable livestock. In the end, tourism must be seen in the first place as a legitimate, obligately peaceful and potentially egalitarian sharing of the Earth.

The human footprint, deep and ancient in the Balearics, allows us to comprehend what kind of impacts our species' activities have. Maybe then might we be able to predict what effects our attitudes can have. Thus, the lessons we can extract from the Balearic Islands may be valuable to understand and save biodiversity throughout the world. Human condition notwithstanding, times ahead look better for the amazing, fragile and precious biodiversity of a small archipelago shipwrecked in the middle of the "first Eden" – showing, by the way, how we may learn to coexist on a planetary scale with the birds, lizards, beetles, snails, plants, and everybody else.

Acknowledgements

We would like to thank GOHNS for inviting us to present this paper in *Calpe 2000*, and to the Government of Gibraltar for incomparable hospitality. Sharing these thoughts with participants in *Linking the Fragments of Paradise* was both a moving support for conservation efforts and a rewarding experience for our work in environmental education.

References

- Alcover, J. A.; Fornós, J. & Ballesteros, E. (eds.) 1993. *Història natural de l'Arxipèlag de Cabrera*. Ed. Moll & C.S.I.C, Palma de Mallorca.
- Alcover, J. A.; McMin, M. & Altaba, C. R. 1994. Eivissa: A Pleistocene Ocean-like Island in the Mediterranean. *National Geographic Research and Exploration*, 10 (2): 236-248.
- Alomar, G; Mus, M. & Rosselló, J. A. 1997. *Flora endèmica de les Balears*. Consell Insular de Mallorca (FODESMA), Palma.
- Altaba, C. R. 1994. La sistemàtica i la conservació de la biodiversitat: el cas de les baldrigtes (Procellariiformes: *Puffinus*). *Anuari Ornitològic de les Balears*, 8 (1993): 3-14.
- Altaba, C. R. 1997. Phylogeny and biogeography of midwife toads (*Alytes*, Discoglossidae): a reappraisal. *Contributions to Zoology*, 66 (4): 257-262.
- Altaba, C. R. 1998. Testing vicariance: melanopsid snails and Neogene tectonics in the Western Mediterranean. *Journal of Biogeography*, 25: 541-551.
- Altaba, C. R. 1999. *La diversitat biològica: una perspectiva des de Mallorca*. Moll, Palma de Mallorca.
- Altaba, C. R. 2000a. Are all mass invasions alike? *Trends in Ecology and Evolution*, 15 (6): 248.
- Altaba, C. R. 2000b. La cabra salvatge de Mallorca: un patrimoni que cal gestionar. *Bioma*, 2: 38-40.
- Altaba, C. R. in press a. L'extinció d'espècies a les aigües dolces de la regió mediterrània. In: *L'aigua: perspectives de futur. I Congrés Balears 2015*. Sa Nostra, Caixa de Balears. Palma de Mallorca.
- Altaba, C. R. In press b. Biodiversity of the Balearic Islands: A paradigm for conservation. In: Vilà, M.; Rodà, F. & Ros, J. (eds.) *Biodiversity and Biological Conservation*. Institut d'Estudis Catalans, Barcelona.
- Artigues, A. 2001. Los científicos obligan a eliminar del Plan Territorial la introducción de especies externas. *El Mundo/El Día de Baleares*, 12-3-2001.
- Balmford, A. 1996. Extinction filters and current resilience: the significance of past selection pressures for conservation biology. *Trends Ecol. Evol.*, 11: 193-196.
- Bestard, I.; Bobadilla, I.; Catalán, A. & Ponsell, L. 2000. *La pèrdua de biodiversitat*. Ferran Sintès, Palma de Mallorca.
- Bifani, P. 1999. Desarrollo sostenible: concepto y práctica cinco años después de Río; implicaciones para las relaciones norte-sur en el Mediterráneo. *Papers de Medi Ambient*, 5: 14-32.
- Conselleria de Turisme. 2000. Balears, la nova política turística. *El Temps*, 19-12-2000, supl.: 1-18.
- Cardona, M. A. 1979. Consideracions sobre l'endemisme i l'origen de la flora de les Illes Balears. *Butlletí de la Institució Catalana d'Història Natural*, 44: 7-15.
- Castroviejo, M. & Herrero, J. (eds.) 1992. *Ecoturismo. Criterios de desarrollo y casos de manejo*. ICONA, Madrid.
- Chacártegui Cirerol G. 1999. Ecotur. Programa para la integración del turismo y el medio ambiente. *Papers de Medi Ambient*, 5: 190-201.
- Cody, M. L. 1986. Diversity, rarity, and conservation in Mediterranean-climate regions. In: Soulé, M. E. (ed.) *Conservation biology: The science of scarcity and diversity*, pp. 122-152. Sinauer Associates, Sunderland, Massachusetts.
- Conselleria de Medi Ambient. 2001. *Medi Ambient. Actuacions juliol 1999 - desembre 2000*. CMA, Palma de Mallorca.
- de Jong, H. 1998. In search of historical biogeographic patterns in the western Mediterranean terrestrial fauna. *Biological Journal of the Linnean Society*, 65: 99-164.
- Edington, J. M. & Edington, M. A. 1986. *Ecology, recreation and tourism*. Cambridge University Press, Cambridge.
- Eckert, A. & Cremer, C. 1997. *Tourism and environment. (Questions and answers, No. 3)*. Council of Europe, Strasbourg.
- Ginés Gràcia, À. 1999. Biodiversidad e imagen corporativa del territorio: los casos de Mallorca y Eslovenia. *Papers de Medi Ambient*, 5: 113-121.
- Greuter, W. 1994. Extinctions in Mediterranean areas. *Philosophical Transactions of the Royal Society of London, Series B*, 344: 41-46.
- Hemmer, H. & Alcover, J. A. (eds.) 1984. *Història biològica del ferreret*. Moll, Ciutat de Mallorca.
- Manera, C.; Rullan, O. & Blázquez, M. 1999. Sobre el modelo de crecimiento económico territorial en las sociedades avanzadas y el desarrollo sostenible. *Papers de Medi Ambient*, 5: 145-161.
- Mayol, J. & Machado, A. 1992. *Medi ambient, ecologia i turisme a les Illes Balears*. Moll, Palma de Mallorca.
- Mooney, H. A. 1988. Lessons from Mediterranean-climate regions. In: Wilson, E. O. (ed.) *Biodiversity*, pp. 157-165. National Academy Press, Washington, D.C.
- Oosterbroek, P. 1994. Biodiversity of the Mediterranean region. In: Forey, P. I.; Humphries, C. J. & Vane-Wright, R. I. (eds.), *Systematics and conservation evaluation*, Systematics Association Special Volume No. 50, pp. 289-307.
- Paul, C. R. C. & Altaba, C. R. 1992. Els mol·lusc terrestres fòssils de les Illes Pitiüses. *Bolletí de la Societat d'Història Natural de les Balears*, 34: 141-170.
- Payeras, M. 2001. El Parlament balear aprova l'ecotaxa. *El Temps*, 17-4-2001.
- Perelló, J. 2001. Recuperem el linx. *Diari de Balears*, 10-3-2001.

Picornell, M. (ed.) 1991. *Turisme i medi ambient a les Illes Balears*. El Tall, Palma de Mallorca.
Picornell Vaquer, M. 1999. Green issues: a fancy or a real competitive advantage? *Papers de Medi Ambient*, 5: 225-233.
Pretus, J. L. & Chust, G. 2001. L'estudi i conservació de la biodiversitat en els paisatges culturals. *L'Atzavara*, 9: 15-50.

Verd, S. 2000. Satisfacció econòmica, preocupació mediambiental. *Gea*, 4: 6-8.
Yll, E.-I.; Pérez-Obiol, R.; Pantaleón-Cano, J. & Roure, J. M. 1997. Palynological evidence for climatic change and human activity during the Holocene on Minorca (Balearic Islands). *Quaternary Research*, 48: 339-347.



Figure 5. Environmental education is probably the key issue in finding a model of sustainable harmony between biodiversity conservation and tourism. Enlightening of both residents and visitors may be the best way to promote wealth and happiness in those small territories fortunate enough to be selected as holiday destinations. As an example of this perspective, perhaps the soundest reason to enforce protection of Cabrera National Park is, arguably but simply enough, that it is the last place in the Mediterranean where one can read the *Odyssey* and feel it is somehow true.