

Notes on *Ganoderma carnosum* Pat. (*G. atkinsonii* Jahn, Kotl. & Pouz.)

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F. Kotlaba and Z. Pouzar (1983) published (in Czech language) a notice on the necessity of replacing the name *Ganoderma atkinsonii* Jahn, Kotlaba and Pouzar by the older name *G. carnosum* Pat. and announced a more detailed paper in "Westfälische Pilzbriefe". But in the meantime, the new name *G. carnosum* (= *G. atkinsonii*) has become widely known, especially through the book of W. Jülich "Kleine Kryptogamenflora" II, b/1, 1984. Still it seems necessary to report on some errors and facts connected with the name *G. carnosum* Pat., the history of which is rather unusual.

Soon after we, H. Jahn, F. Kotlaba and Z. Pouzar (1980) had described *Ganoderma atkinsonii* as a new species, L. Ryvarden, Oslo, notified us that *Ganoderma carnosum* Pat. (1889), the type of which he had studied recently in the Farlow Herbarium, Harvard, USA, possibly might be identical with our species. We then checked the type specimen which was found somewhat damaged by the treatment with some chemical, probably alcohol, the resinous matter from the cutis elements being extracted and the permeability of the hyphal walls changed, with the skeletal hyphae swelling in strong KOH. But the tubes contained large spores corresponding to those of *G. atkinsonii*. Besides, Patouillard described the colour of the pileus of *G. carnosum* as "castaneo-nigra", this is one of the most important features of *G. atkinsonii*, too. *G. carnosum* was found on *Abies alba*, which is the main host of *G. atkinsonii*. Therefore, after some discussion, we consented to accept *G. carnosum* as the valid name of the fungus.

When considering the problem of a name for our new species, we even had compared *G. carnosum* Patouillard (1889), but the description did not allow an identification. Furthermore, as Pilát (1942) had stated laconically, nobody had seen the fungus again since it had been described.

The strange and misleading name "*carnosum*" is due to an error of Patouillard. He described the fungus from a collection made 1881 in the French Pyrenees which later was sent to him. In the latin diagnosis of the description in Patouillard's paper on *Ganoderma* the margin is described: "Margine albicante, crasso, succoso-mollis". Patouillard regarded this as the main characteristic of the species, in his remarks he stated that the fungus is "distinguished easily from all other species of the genus by its margin which is juicy, voluminous and of a consistency analogous to that of young specimens of *Fistulina*".

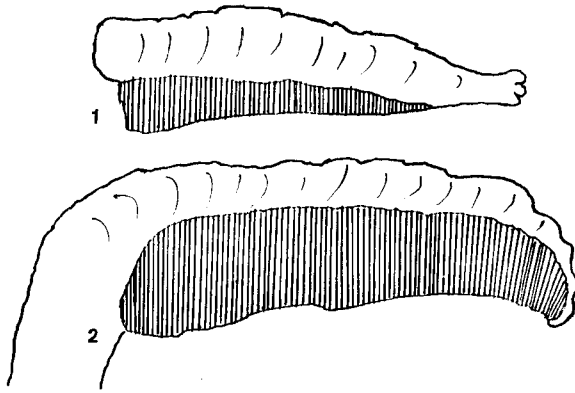


Fig. 1, 2. *Ganoderma carnosum* Pat. (*G. atkinsonii*). Sections from dried specimens. Fig. 1 showing young, growing specimen, fig. 2 mature specimen. Fig. 1. Type specimen of *G. carnosum*, Farlow-Herbarium, del. H. Jahn. - Fig. 2. Nr. 1774 from „Champignons du Maroc“ (Inst. Bot. Montpellier), leg. G. Malençon, Middle Atlas, *Cedrus atlantica*, 20. X. 1947, as „*G. lucidum* ssp. *sessile*“, rev. H. Jahn. From a drawing by G. Malençon. 2/3 nat. size.

As shown in the drawing made from a part of the type specimen of *G. carnosum* (fig. 1), the fungus was collected in an immature state: Growing tubes are to be seen only in the older part of the carpophore, they do not reach the margin (now contracted) which was still soft and juicy in the fresh, growing fungus at the time of its collection. The tubes of *G. carnosum*, as in *G. lucidum*, continue growing downwards until the fungus is fully mature, with the lacquered margin enclosing them (fig. 2).

Probably young fruitbodies with whitish fleshy margin as they are typical for the species of the *G. lucidum*-group were beyond Patouillard's personal experience, and he regarded the swollen, fleshy margin as an important specific character of the species. He had not even recognized his mistake eight years later when the description of the species was published in his study on *Ganoderma* (1889). He named it "*carnosum*" disregarding the fact that according to his text only the margin was fleshy but not the context. If Patouillard had received a mature specimen he would hardly have described it as a species but included it in *G. lucidum*. Thus, *G. carnosum* was established merely owing to a misinterpretation of a transitory feature in the young fungus. The name "*carnosum*" led to a nearly complete ignoring of the fungus by the mycologists to whom a "*fleshy Ganoderma*" seemed to be an absurdity. We, the authors of *G. atkinsonii* (named in honour of its discoverer, G. F. Atkinson), regret very much that our name had to be replaced by the incorrect and rather foolish name *G. carnosum*.

The only mycologist who had recognized *G. carnosum* after studying the type was Dr. R. L. Steyaert, Bruxelles. He found (Steyaert 1967, p. 198) that the species was very close to *G. lucidum* and distinguished from this species only by the characteristics of the cutis (hymeniderm), i.e. the fact that the resinous matter was hardly influenced by KOH-solution. In a letter to H. Jahn (21. 1. 1971) Steyaert wrote: "The melanoid substances of *G. carnosum* do not seem to be

solubilized or displaced by KOH solutions, even strong ones, whereas in *G. lucidum* the strong solutions completely disorganize the cutis". When comparing this reaction in herbarium specimens of *G. lucidum* and *G. carnosum* (*G. atkinsonii*), J a h n found that in *G. lucidum* the thin resinous layer superimposing the hymeniderm in most cases easily dissolves in 1-2% KOH-solution. In 2-3% KOH even the resinous matter inside the palisade hyphae of the hymeniderm becomes dissolved, their tops are swelling. In about 4% KOH the whole hymeniderm is destroyed almost immediately, it seems to "explode". In *G. carnosum* the cutis elements produce a thicker and darker coloured resinous substance, and the process of disintegration in KOH requires more time. In 4-5% KOH the hyphae of the hymeniderm swell strongly on the top, they begin to become destroyed in about 7% KOH.

This holds true only with specimens collected in a fresh, living state and conserved without certain chemicals, because the resinous impregnation is rather sensitive to external influences. In specimens collected when old or dead which have been exposed to sun, rain or snow, the resinous matter of the cutis becomes damaged or removed, one observes only a quick faint reaction to KOH or none at all. The same happens with specimens treated with p-dichlorobenzene. Even the type specimen had been affected by a chemical (probably alcohol) which had extracted the resinous substance, a fact which S t e y a e r t had overlooked. The cutis elements in the type of *G. carnosum*, therefore, could no longer react with KOH in a normal way, they only swell lightly but do not become destroyed even in 15% KOH. Normal specimens of *G. carnosum* (*G. atkinsonii*) which we (J a h n, K o t l a b a and P o u z a r) had sent to Dr. S t e y a e r t on several occasions, were all determined by him as *G. lucidum*.

S t e y a e r t (1967, p. 199) had determined as *G. carnosum* two specimens of *Ganoderma* from Morocco sent to him by G. M a l e n ç o n in 1964, using for this only his characteristic of the lacking KOH-reaction which, as shown above, is useless. When H. J a h n had the opportunity to study the collections of *Ganoderma* made by G. M a l e n ç o n in Morocco (deposits in the Botanical Institute of the University of Montpellier, France), he controlled both specimens. They had been treated with a solvent (possibly when being poisoned with HgCl₂). No. 4629, collected on *Schinus* in the lowland, has very finely dotted spores, this is *G. resinaceum* Boud. ss. Bourdot et Galzin. No. 2468, collected in the Middle Atlas on *Cedrus atlantica*, has coarsely ornamented spores with rather distant warts, similar to the spores of *G. carnosum* (*G. atkinsonii*). But the specimen has a very thick context and reddish (not darkened) colour of the cutis even when fully ripe, it calls in mind *G. resinaceum*; it might possibly represent another, perhaps unknown species. This fungus was determined by M a l e n ç o n as "*G. lucidum* ssp. *sessile* nob. = *G. resinaceum* R. Maire non Boudier". Other specimens from the Middle Atlas were labelled with the same name, among them some fungi with darker cutis quite identical with *G. carnosum* (*G. atkinsonii*). Especially typical for *G. carnosum* is No. 1774 of which M a l e n ç o n has made a special study (not published), in which he mentioned the darker colour of the pileus (brun pourpré sombre), with a drawing which is here reproduced as fig. 2 (as an example for a fully ripe specimen of *G. carnosum*).

When the late Austrian mycologist Dr. S. P l a n k (Graz) visited the Atlas Moun-

tains in spring 1982 before his falling ill, he found there *G. carnosum*, too, and sent an old specimen to H. Jahn. As he wrote at the same time, he was astonished to see on *Cedrus atlantica* fruitbodies of *G. carnosum* (*atkinsonii*) together with the larger, red fungus (like No. 2468 of G. Malençon) which made him think of *G. resinaceum*, "with many transitions". This seems to be a still unsolved problem.

Acknowledgements

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Zusammenfassung

Die Geschichte des Namens *G. carnosum*, über die Kotlaba & Pouzar (1983, in tschechischer Sprache) berichtet haben, ist merkwürdig genug, um auch hier mitgeteilt zu werden.

Bei der Suche nach einem Namen hatten wir auch das Taxon *G. carnosum* Patouillard 1889 geprüft, zumal der Typus dieser Art von *Abies* stammte. In der Beschreibung dieses Pilzes mit dem merkwürdigen fleischigen, „an *Fistulina* erinnernden“ Hutrand konnten wir unseren Pilz nicht erkennen. Seit seiner Beschreibung war *G. carnosum* von niemandem wiedergefunden worden. Donk (1974) hatte *G. carnosum* in seiner „Check List of European Polypores“ ohne Kommentar angeführt, dies bedeutete keine Anerkennung der Art durch Donk, sondern nur das Zitat einer in Europa beschriebenen, aber bisher nicht eindeutig als nicht-existent erkannten Art (vgl. Vorwort bei Donk). G. Malençon schrieb mir (1982), die französischen Mykologen hätten nicht an die Existenz eines solchen Pilzes geglaubt, weil ein „fleischiges *Ganoderma*“ nicht vorstellbar wäre, man hätte einen Irrtum Patouillards für möglich gehalten.

Dies war tatsächlich der Fall. Nachdem L. Ryvar den uns nach Studium des Typus von *G. carnosum* im Farlow-Herbarium (USA) darauf aufmerksam gemacht hatte, daß dieser Pilz vielleicht unser *G. atkinsonii* sein könnte, untersuchten wir das Typus-Material gründlich. Einige Merkmale, besonders die Struktur der matt aussehenden, nicht glänzenden Kruste, waren schlecht erhalten, die Permeabilität der Hyphenwände war verändert, u.a., aber nach einigen Diskussionen konnten wir die Identität mit *G. atkinsonii* bestätigen und das Rätsel vom „Fleischigen *Ganoderma*“ aufklären.

Die Skizze einer Scheibe des Typus (Fig. 1) zeigt auf den ersten Blick, wo der Irrtum von Patouillard gelegen hatte: er hatte einen jungen, unreifen Fruchtkörper beschrieben! Das Exsiccata ist vorn stark geschrumpft und zeigt nur hinten junge Röhren, die nicht bis zum Hutrand reichen. In Fig. 2 ist zum Vergleich ein ausgereifter Fruchtkörper im Schnitt dargestellt. Der Hutrand von *G. carnosum* war nach der Schilderung von Patouillard weißlich, saftig, weich und angeschwollen, so wie das oft bei jungen Fruchtkörpern der *G. lucidum*-Gruppe der Fall ist. Patouillard, der den Pilz nicht selbst gesammelt hatte und offenbar keine eigene Erfahrung mit solchen jungen Fruchtkörpern besaß, glaubte in diesen transitorischen Jugendmerkmalen die Merkmale einer neuen Art zu erkennen, die damit „von allen übrigen Gattungsverwandten leicht zu unterscheiden“ wäre. So taufte er den Pilz *G. carnosum*. Einen reifen Fruchtkörper der Art hätte Patouillard sicherlich als *G. lucidum* bestimmt. *G. carnosum* ist also lediglich auf Grund eines Irrtums, eines Interpretationsfehlers, als Art aufgestellt worden! Wir, die Autoren von *G. atkinsonii* (nach seinem Entdecker G. F. Atkinson benannt) bedauern sehr, daß unser Pilz nun einen so irreführenden, absurden Namen tragen muß.

Das von R. L. Steyaert (1967) beim Typus gefundene Merkmal zur Bestimmung von *G. carnosum*, die fehlende KOH-Reaktion der Lackkruste, erwies sich bei der Nachprüfung als nicht brauchbar. Steyaert hatte übersehen, daß der harzige Stoff in den Cutishyphen beim Typus (durch Tränken des Pilzes mit einem organischen Lösungsmittel) entfernt worden war, weshalb natürlich keine Reaktion mit KOH mehr eintreten konnte. Von uns (Kotlaba, Pouzar und Jahn) mehrfach übersandte Exsiccate des späteren *G. atkinsonii*, also *G. carnosum*, hatte Steyaert stets als *G. lucidum* bestimmt. Wegen des Fehlens der KOH-Reaktion der Cutiselemente hatte Steyaert (1967) auch zwei ebenfalls chemisch behandelte *Ganoderma*-Exsiccate aus Marokko als *G. carnosum* bestimmt, sie erwiesen sich bei der Nachprüfung des von G. Malençon gesammelten *Ganoderma*-Materials („Champignons du Maroc“, Bot. Inst. Montpellier) als andere Arten. Unter diesem Material befand sich aber auch das richtige *G. carnosum* (*G. atkinsonii*) aus dem Mittleren Atlas, von Cedrus. Das Vorkommen dort hatte auch der verstorbene Dr. S. Plank (Graz) bestätigt, der im Frühling 1982 kurz vor seiner schweren Erkrankung das Atlas-Gebirge besucht und H. Jahn ein Exsiccacat von *G. carnosum* (*G. atkinsonii*) übersandt hatte.

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