

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 41

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TAKASHI ADACHI, TAKAFUMI ISHII
and HIDEMASA HIDAKA

Appeal No. 93-2353
Application 07/571,003¹

HEARD/ON BRIEF

MAILED

SEP 07 1995

PAT.&T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Before WILLIAM F. SMITH, GRON and ELLIS, *Administrative Patent Judges.*

ELLIS, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal of the final rejection of claims 2-7, which are all the claims pending in the application.

Claim 2 is illustrative of the subject matter on appeal and reads as follows:

2. A method for cultivating a plant which comprises using a plant growth accelerating oligosaccharide, wherein the

¹ Application for patent filed August 22, 1990. According to applicants, the application is a continuation of Application 07/109,374, filed October 19, 1987, now abandoned.

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as regulatory molecules which help to control numerous plant functions such as defense against disease, growth, differentiation during development, and reproduction. Oligosaccharins are fragments which are released from plant cell walls by different enzymes; different enzymes releasing different oligosaccharins. They are comprised of oligosaccharides, short chains of sugar molecules containing between 2 and, approximately, 15 monosaccharide units linked by glycosidic bonds. Albersheim discloses twelve monosaccharides known to be components of the primary cell wall of plants. Primarily, the review article focuses on the discovery that oligosaccharins play an important role in the defense against disease because they induce plant cells to synthesize antibiotics.

With respect to plant growth Albersheim briefly discloses that (i) a nonasaccharide fragment of xyloglucan (or a closely related oligosaccharide) *inhibits* auxin (a plant hormone which stimulates pea stem growth)-induced growth, and (ii) several different mixtures of oligosaccharides isolated from sycamore cells inhibit flowering and promote vegetative growth in duckweed and tobacco-explant cultures. Albersheim postulates that:

One day it may be possible to spray specific oligosaccharins (or analogues of oligosaccharins) on plants (or to manipulate the genes controlling the release and metabolism of oligosaccharins) to tell plants to flower or to form seeds and fruits or tubers,

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to become resistant to disease or an insect, to drop their fruit, to grow faster or to become bushier. Oligosaccharins should eventually have a significant impact on agricultural yields.

Another reference relied on by the examiner, Shelukhina, is an abstract which discloses that hexamethylene diamine pectate is a stimulator of plant growth. The polysaccharide derivative comprises 23-25 monosaccharide units.

Nilsson discloses a method of regulating the synthesis of oligosaccharides, in general. Specifically, Nilsson describes a method of controlling the regioselectivity of the glycoside bond between the glycosyl donor and the glycosyl acceptor during enzymatic production of an oligosaccharide. To underscore the usefulness of his invention, Nilsson lists several functions of oligosaccharides under a general caption of "universities and industry are at present working intensely on developing the use of biologically active oligosaccharides within a number of different fields."³ These functions include, *inter alia*, "the stimulation of plant growth and protection against pathogens."⁴ Nilsson does not disclose any oligosaccharide which actually stimulates plant growth.

³ Col. 1, lines 41-49.

⁴ Col. 2, lines 8-9.

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Opinion

We have carefully considered the respective positions of the appellants and the examiner as set forth in the (i) appellants' brief, (ii) examiner's answer, (iii) the reply brief, (iv) the supplemental examiner's answer, and (v) final letter. We find ourselves in substantial agreement with the appellants.

The examiner's position is best summarized on p. 7 of the answer where he states:

the prior art of record teaches that the claimed compounds as a class were art recognized to have biological effects. The isolation of any one specific member of the class would have been obvious and require only routine experimentation to determine if, for example, the breakdown products of gum arabic (arabinose, galactose and rhamnose) would have the same growth stimulating effects as the breakdown products of the plant cell wall.⁵

He concludes that "[w]hat Appellants have done is to take a prior art recognized phenomena and attempted to pick and choose among related compounds for effects not specifically taught in the prior art."⁶ We find this position untenable.

First, contrary to the examiner's assertion, we find from a fair reading of the references that the use of oligosaccharides to stimulate plant growth was not a well-known phenomenon, but rather a field of research requiring further

⁵ The examiner's answer, p. 7, para. 1.

⁶ *Id.*

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development and inventive skill. The portions of Albersheim and Nilsson referenced *supra* constitute the entire teachings within the publications which relate to the use of oligosaccharides to stimulate plant growth. We find these teachings are only suggestive of avenues of potential research.

Second, as correctly pointed out in the appellants' brief, the present invention is directed to specific oligosaccharides which were selected from a genus comprising numerous oligosaccharides. Two of the prior art references, Albersheim and Nilsson, merely disclose that oligosaccharides, in general, may be useful in stimulating plant growth. Neither publication even alludes to the use of the specific compositions recited in claim 2. Although Albersheim discloses that "mixtures of oligosaccharides isolated from sycamore cells" promote vegetative (nonreproductive) growth in duckweed and tobacco explants,⁷ he fails to provide any description as to the composition of his "mixtures." Conversely, the specific nonasaccharide, xyloglucan or a closely related oligosaccharide, which is disclosed by Albersheim, actually inhibits plant growth. Consequently, we find no teachings or suggestion in Albersheim or Nilsson to employ the present oligosaccharides to cultivate plants.

⁷ Albersheim, p. 64, col. 3, first complete paragraph.

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As to the Shelukhina abstract, and publication, we agree with the appellants that the disclosed hexamethylene diamine pectate is a polysaccharide derivative containing 23-25 monosaccharide units. Therefore, the references do not teach or suggest oligosaccharides containing 2 to 20 monosaccharides as required by claim 2.⁸

The examiner has the initial burden of establishing that the teachings of the cited prior art would have suggested the use of the present compositions in the claimed process, to a person having ordinary skill in the art, and that such a person would have a reasonable expectation of success. *In re O'Farrell*, 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988). This suggestion must be in the prior art, and not in the applicant's disclosure. *In re Dow Chemical Co.*, 837 F.2d 469, 5 USPQ2d 1529 (Fed. Cir. 1988). In the case before us, the appellants have provided data, in table form, which demonstrate that the present oligosaccharides comprise monosaccharide units which are not taught or suggested by the prior art of record as being useful in stimulating plant growth.⁹ Moreover, the teachings of Albersheim (the nonasaccharide, xyloglucan, inhibits plant growth) show that

⁸ The appellants' brief, pp. 6-7, discusses the art-recognized use of the term "oligosaccharide" as pertaining to a sugar composed of 2 to, approximately, 15 monosaccharides. We find the claim language is consistent with this usage.

⁹ The brief, Tables 2-(1) and 2-(2).

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not all oligosaccharides can be successfully employed in the present method. Therefore, vague suggestions in the prior art to use oligosaccharides to stimulate plant growth do not provide an expectation that the present oligosaccharides will be successful for that purpose. As noted, the burden is on the examiner to provide reasons, based on the prior art, for selecting the claimed oligosaccharides and using them to cultivate plants. In the present case the examiner has not met that burden. See *In re Kratz*, 592 F.2d 1169, 1175; 201 USPQ 71, 76 (CCPA 1979) (the court "rejected the argument that undirected skill of one in the pertinent art is an adequate substitute for statutory prior art.")

In response to the appellants' arguments, the examiner has urged that the hexamethylene diamine moiety of the composition taught by Shelukhina is "an artifact of the extraction procedure which would not be expected to impart plant growth activity independent of the pectate."¹⁰ Having carefully reviewed the Shelukhina reference, it is difficult to discern on what basis the examiner reached this conclusion. We find that the reference clearly teaches the use of the entire composition to stimulate plant growth.

¹⁰ The examiner's answer, the sentence bridging pp. 7 and 8.

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Moreover, assuming *arguendo* that pectin is the active component of the disclosed composition, we still find this argument unpersuasive. First, as we discussed *supra*, Shelukhina teaches the use of a polysaccharide derivative containing 23-25 monosaccharide units, and not an oligosaccharide as required by the claims. Second, the examiner has failed to provide any reasons as to why, given the composition of pectin, it would have been obvious to those having ordinary skill in the art to select the appellants' oligosaccharides to cultivate plants. That is, the examiner has failed to provide any evidence that the composition of pectin renders the use of the claimed oligosaccharides obvious. Accordingly, we find that the examiner has not provided any factual evidence that supports his position. A conclusion of obviousness must be based on evidence, not unsupported arguments. *In re Freed*, 425 F.2d 785, 165 USPQ 570 (CCPA 1970); *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967).

NEW GROUND OF REJECTION

Under the authority of 37 C.F.R. § 1.196(b), we make the following new ground of rejection.

Claims 2-7 are rejected under 35 U.S.C. § 112, second paragraph as being indefinite, incomplete, and misdescriptive.

Claim 2 is indefinite and incomplete in that it is directed to a method of cultivating a plant; however, it fails to

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recite the effective amounts of the oligosaccharides, the metes and bounds of the claimed method are unclear.

Claims 2-7 are indefinite and misdescriptive since the steps recited therein are not directed to a method of cultivating a plant.

Any request for reconsideration or modification of this decision by the Board of Patent Appeals and Interferences based upon the same record must be filed within one month from the date of the decision (37 CFR 1.197). Should appellants elect to have further prosecution before the examiner in response to the new rejection under 37 CFR 1.196(b) by way of amendment or showing of facts, or both, not previously of record, a shortened statutory period for making such response is hereby set to expire two months from the date of this decision.

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No time period for taking any subsequent action in connection
with this appeal may be extended under 37 CFR 1.136(a).

REVERSED - 37 CFR § 1.196(b)

William F. Smith

WILLIAM F. SMITH)
Administrative Patent Judge)

Teddy S. Gron

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Joan Ellis

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