The dignity of living beings with regard to plants

Federal Ethics Committee on Non-Human Biotechnology (ECNH)

Moral consideration of plants for their own sake

1 Starting point of the discussion

1.1 Legislative context

The Federal Constitution has three forms of protection for plants: the protection of biodiversity, species protection, and the duty to take the dignity of living beings into consideration when handling plants. The constitutional term «living beings» encompasses animals, plants and other organisms. At legislative level, the Gene Technology Act limits the scope of the term to animals and plants. Previous discussion within constitutional law relates the term *Würde der Kreatur* («dignity of living beings») to the value of the individual organism *for its own sake.*

Since its establishment by the Federal Council in April 1998, the ECNH has been expected to make proposals from an ethical perspective to concretise the constitutional term dignity of living beings with regard to plants. Although previous discussion of *Würde der Kreatur* was marked by the context of the legal interpretation of the constitution an ethical discussion should be carried out independently of this.

1.2 Preliminary remarks on the ethical discussion

In preparation for this ethical discussion, in 2004 the ECNH commissioned a literature review by Prof. Jürg Stöcklin (Botanical Institute of the University of Basel). It has since been published as «Die Pflanze. Moderne Konzepte der Biologie» in the series «Beiträge zur Ethik and Biotechnologie».[1] Florianne Koechlin, biologist and member of the ECNH, supported this study by carrying out four interviews with Prof. Bernhard Schmid (Head of the Institut für Umweltwissenschaften at the University of Zurich), Prof. Thomas Boller (Botanical Institute of the University of Basel), Prof. Ted Turlings (Laboratoire d'écologie et d'entomologie, Institute of Zoology, University of Neuchâtel), and Prof. Frederick Meins (Friedrich Miescher Institute, Basel). Between 2003 and 2006 the ECNH heard from several other external experts from

1 Jürg Stöcklin, Die Pflanze. Moderne Konzepte der Biologie, vol. 2 of the series «Beiträge zur Ethik and Biotechnologie», published by the ECNH, 2007. The book can be downloaded from the committee's website www.ekah.admin.ch.

The role of intuition in ethical discourse

Intuition is used in general to describe the ability to obtain insight without understanding the fundamental connections on a rational level. Even in an ethical discussion, when one is confronted with a new problem an intuitive approach can initially be applied, if it is borne in mind that intuitions are closely associated with previous experiences and personal preferences. Since these experiences and preferences are strongly subjectively determined, just as is «common sense», caution is needed when considering intuitive insights as a basis for generalisation. The results of an intuitive approach must therefore ultimately be scrutinised by rational argument.

various disciplines: Dr Angela Kallhoff (philosopher, Westfälische Wilhelms-Universität in Münster, on the principles of plant ethics and the evaluation of plant life in biology and philosophy), Dr Nikolai Fuchs (agricultural engineer and farmer, Head of the Agricultural Department of the Natural Sciences Section of the Freie Hochschule für Geisteswissenschaft at the Goetheanum in Dornach), Dr Heike Baranzke (theologian at the Moraltheologisches Seminar of the Catholic Theological Faculty of the Rheinische Friedrich-Wilhelms-Universität Bonn, on the meaning of the term «dignity of living beings» in the context of plants), and Prof. Hans Werner Ingensiep (philosopher and biologist, Institute for Philosophy at the University of Duisburg-Essen and the Institute for the History of Medicine and Science at the University of Lübeck, giving perspectives from biology, the history of ideas and science, and biophilosophy).[2]

The general ethical questions are whether, and why, plants should be protected. There are two possible arguments to justify the protection of plants: either that they should be protected for their own sake, or that they should be protected for the sake of others. That plants should in some circumstances be protected in the interest of a third party, e.g. because they are useful to humans, is undisputed. Independent of the term dignity of living beings, then, the central question therefore remains: whether plants have an inherent worth, and should therefore be protected for their own sake. For some people, the question of whether the treatment or handling of plants requires moral justification is a meaningless one. The moral consideration of plants is considered to be senseless. Some people have warned that simply having this discussion at all is risible. In their view, the human treatment of plants is on morally neutral ground and therefore requires no justification. But there are other reasons put forward to exclude plants from the circle of organisms to be valued for their own sake. One is that human life would become morally too demanding and too complicated if this area of human action had also to be justified. An additional fear is that ethical positions that value plants for their own sake could relativise higher-weighted moral responsibilities towards humans (and animals).

Although the authority of intuition in ethical discourse is contested, it was hoped in the initial phase of the discussion at least, to draw on concrete, typical examples to agree on general criteria for dealing with plants.

It became clear, however, that for plants – unlike animals – it was almost impossible to refer to moral intuition. There is no social consensus on how

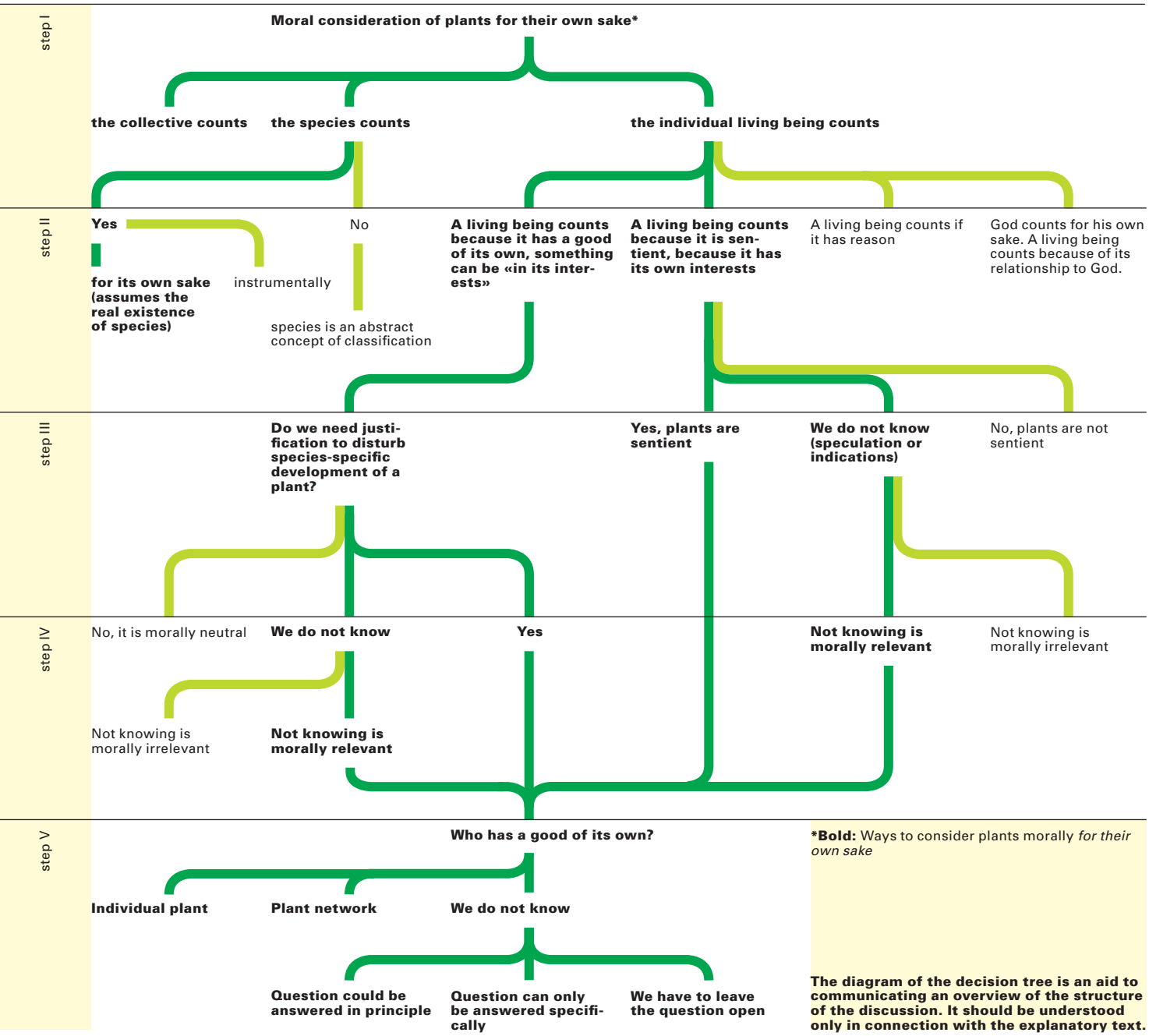
2 The Federal Office for the Environment also published a report on the subject in 2001/2002: Andrea Arz de Falco/Denis Müller, Wert and Würde von «niederen» Tieren und Pflanzen. Ethische Überlegungen zum Verfassungsprinzip «Würde der Kreatur», Freiburg, 2001. (In French: Andrea Arz de Falco/Denis Müller, Les animaux inférieurs et les plantes ont-ils droit à notre respect? Réflexions éthiques sur la «dignité de la creature», Geneva, 2002.)

to deal with plants. Even within the ECNH, the intuitions relating to the extent and justification of moral responsibilities towards plants were highly heterogeneous. Some members were of the opinion that plants are not part of the moral community, because they do not satisfy the conditions for belonging to this community. Others argued that plants should not belong to it, because otherwise human life would be morally over-regulated. A further group felt that there were particular situations in which people should refrain from something for the sake of a plant, unless there are sufficient grounds to the contrary. This opinion was justified either by arguing that plants strive after something, which should not be blocked without good reason, or that recent findings in natural science, such as the many commonalities between plants, animals and humans at molecular and cellular level, remove the reasons for excluding plants in principle from the moral community. The only criterion on which all the members could agree, despite their very differing intuitions, was that we should not harm or destroy plants arbitrarily. Whether concrete ways of acting could be derived from this prohibition on the arbitrary handling of plants, and what they might be, remained unclear.

Since the intuitive approach did not lead any further, a theoretical procedure was followed. Most ECNH members assume that the dignity of living beings is not an absolute value, but is achieved by the balancing of morally relevant interests: the good, or «interests», of plants should be weighed up against the interests or goods of other organisms. A prerequisite for balancing interests in this way, however, is that plants have *their own* interests, and these should be considered morally for the plant's own sake. So if we are trying to put the idea of the dignity of living beings into concrete terms for plants, we must first show which basic ethical positions permit the consideration of plants *for their own sake.* This discussion was structured by means of a decision tree.

It was important to clarify step by step the positions the committee members took. The majority and minority opinions can also be followed step by step. After clarification of the conditions under which there are moral responsibilities towards plants for their own sake, the final section draws conclusions for the ethically justifiable treatment of plants.

Decision tree



***Bold:** Ways to consider plants morally *for their own sake*

The diagram of the decision tree is an aid to communicating an overview of the structure of the discussion. It should be understood only in connection with the explanatory text.

2 Notes on the decision tree

Inherent worth, good of its own and own interests

The terms inherent worth, good of its own and own interests are frequently used in the report. If something has inherent worth, this means it has something, which we also call «dignity». A being that has inherent worth therefore counts morally for its own sake. A being has a «good of its own» if one can do good or bad things to it, i.e. if the being can be injured. The term «own interests» is used synonymously with good of its own in this report.

The decision tree only traces the ethical positions which assume a plant's *inherent worth*, and which therefore permit the moral consideration of plants *for their own sake*. In addition to ethical positions that consider organisms for their own sake, there are further positions that could justify the protection of plants. These justifications however are not linked to the plants themselves, but follow from the person who is assigning value to the plants.

The ECNH's discussion differentiated three concepts of value:

- **Instrumental value:** Plants should not be protected for their own sake, but because and as long as they are of benefit to humans (or other organisms), e.g. as crops or as part of biodiversity.
- **Relational value:** Plants should not be protected for their own sake, but because someone considers them to be worthy of protection. Their protection-worthiness is in relation to a value ascribed to them because of particular properties. For example, a tree may have a particular value for an observer, because it was planted in memory of a person who has died. An aesthetic value is also a relational value.
- **Inherent worth:** Plants possess inherent worth. This inherent worth means they should be protected for their own sake.

These three concepts of value can be illustrated using the example of a rosebush:

- The rosebush has an instrumental value, because a rose hedge protects against undesired intrusions.
- The rosebush has a relational value, because its beautiful flowers remind you of your dead grandmother.
- The rosebush has inherent worth, independently of whether it is useful or whether someone ascribes a value to it.

All organisms, not only plants, can also always have an instrumental or relational value, since all organisms always have a mutual relationship with others. Human beings, as carriers of human dignity, are also seen as members of society in various func-

tions that have instrumental value, e.g. as members of families or as workers. This does not necessarily entail a failure to respect their dignity. What is decisive for the respect of dignity is that an entity is not treated solely as a means to an end. The instrumental value of plants does not exclude a possible inherent worth. Equally, assigning them a relational value is also compatible with the possibility of having their own inherent worth.

2.1 What counts morally for its own sake: the collective, the species or the individual?

Decision tree step I

First, it is important to clarify which moral objects count in the consideration of plants: the plant collective, the plant species or the individual organisms, i.e. the individual plant.

2.1.1 Plant collectives

All members of the ECNH are unanimous that plant communities also always have an instrumental and a relational value, but that this does not exclude their having inherent worth. As moral objects that should be protected for their own sake, plant collectives can be viewed from various perspectives. The Committee discussed some of these different perspectives with the aim of formulating the boundaries of these collectives: biotopic plant communities in general; plant communities such as a forest or a meadow; plant communities that include the interaction with microorganisms; and on to a comprehensive definition of the collective that goes beyond the community of plants. The term biodiversity was also discussed under the aspect of the plant collective, but dropped again, since biodiversity cannot be understood as a collective. The terminology of plant populations and reproductive communities played a subsidiary role in the discussion, which was marked from the outset by the concept of plant *networks*. Plant networks are more extensive than

Arbitrary harm or destruction

The definition of arbitrary harm or destruction is «harm or destruction without rational reason». Not destroying plants arbitrarily means that not *any* reason is sufficient to justify destroying them, but that there must be a *rational* reason. An example of arbitrary treatment used in the discussion was the farmer who, after mowing the grass for his animals, decapitates flowers with his scythe on his way home without rational reason. However, at this point it remains unclear whether this action is condemned because it expresses a *particular moral stance of the farmer towards other organisms* or because something bad is being done *to the flowers themselves*.

populations or reproductive communities, and include other organisms that are not part of them, e.g. mycorrhiza.

A clear **majority** of the members takes the position that plant collectives have no inherent worth.

A **minority** is of the opinion that plant collectives are valuable for their own sake.

All positions that assume plant collectives to have inherent worth are confronted with the problem of distinguishing this community, as an entity, from others. These positions have to produce plausible reasons for why, and at which point one collective is distinguished from another.

It is clear to some members that the term of the collective must be defined even more broadly than plant populations or reproductive communities, since all organisms stand in mutual relationship with one another. It is argued that their organisation makes plants more diffuse and permeable to their environment than organisms that are centrally controlled by nervous systems and are not dependent on a location. The differentiation of individual plants is therefore more difficult to grasp and must be conceived of differently than, for example, that of animals. For this reason, the collective plays a special role for plants.

One position that draws the boundary very broadly around the entity of the plant collective appeals to the idea of diversity. Diversity is a feature of Nature as a whole and thus of all biological communities. Here we reach beyond the biocentric position to an ecocentric one. The term diversity takes account of the interaction of all organisms. If one player is removed or added, the whole game changes. From the position that plant collectives have inherent worth, it ensues that every disturbance would require justification.

Against such a position one could object that *not every* change brought about by humans should be valued as morally negative per se, and should not be equated with harm or destruction in every case. Change is indissolubly associated with the development of a community, as only through a process of change can anything new be created.

This objection is countered by the argument that a change is morally wrong if it is at the cost of other goods worthy of protection. These goods can include all or only particular forms of life. One representative of such a position, drawing the circle of goods worthy of protection very wide, was Albert Schweitzer. For Schweitzer, *all life* is worthy of protection, and thus in *every* action involving life a tragic dilemma arises: for humans' own survival there is no way around destroying life. Schweitzer concludes from this that human beings face a demand to treat Nature with restraint rather than arbitrarily.

This position requires that it is not just plant communities that can be harmed; so can the individual plant. One criti-

An example of a stepwise cognitive procedure

A cognitive procedure in accessing a new building zone would require the local conditions to be investigated step by step, in order to find out what is there and what interplay exists between the indigenous plants and this environment. The location should not just be built on, but buildings should be carefully and considerately inserted into it.

Prima facie
(Lat. «at first glance»)

Having *prima facie* power over plants means that we are permitted to do to plants whatever we want as long as new evidence does not provide us with good, i.e. sensible and weighty, reasons not to do so.

cism is that this position does not formulate general criteria, but can only assess contextually in individual cases whether the handling of plants is restrained and therefore morally justifiable within the situation of dilemma.

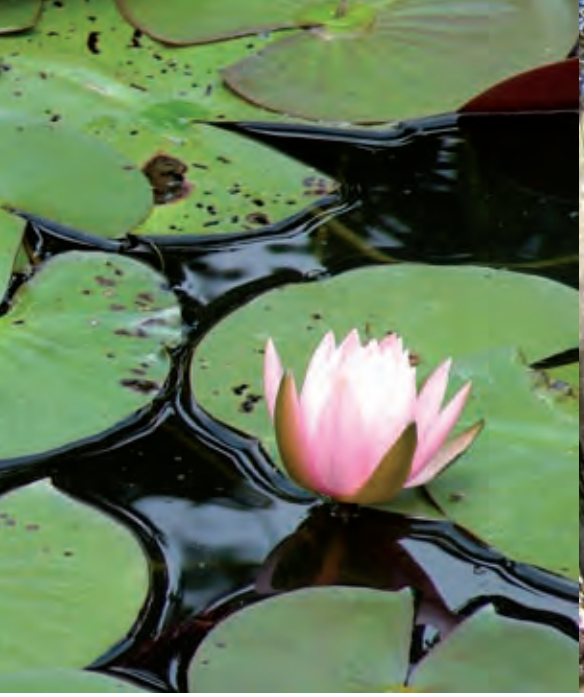
The committee also discussed whether in cases of lack of knowledge, as often happens in the human engagement with plants, it is appropriate to assume that the not (yet) understood «Other» could be affected as much as oneself. A careful and considerate procedure is therefore required. This procedure does not mean reliance on intuition and empathy, but a stepwise *cognitive procedure* that is used to try to discover where the Other's space begins, in order to safeguard its boundaries.

The great **majority** of the ECNH members holds the opinion that *prima facie* we do not possess unrestricted power over plants. We may not use them just as we please, even if the plant community is not in danger, or if our actions do not endanger the species, or if we are not acting arbitrarily. A **minority** of the members is of the opinion that *prima facie* we may use plants as we please, as long as the plant community or the species is not in danger and we are not acting arbitrarily.

The members were **unanimous** that there are moral reasons why we should be restrained in handling plants, because we may influence or even destroy other players of the natural world, and so alter their relationships.

A clear **majority** also takes the position that we should handle plants with restraint for the ethical reason that individual plants have an inherent worth. Conversely, a **minority** is of the opinion that individual plants have no inherent worth.

Two positions represented on the Committee require – with varying justifications – restraint in handling plants. There are also different meanings to «handling with restraint». We could understand it to mean that plants may not be arbitrarily impaired or destroyed. Restraint can however also mean a requirement to handle plants carefully and considerately, and to limit their use and exploitation. Handling plants includes the social practice of instrumentalising them in a disproportionate and therefore impermissible way. Unlike the concepts of value described above, this is not primarily about the inherent worth or relational value of plants, but the *institutionalised framework* of the impermissible handling of living beings. In this case, restrained handling could also mean that there must be a sound and appropriate justification for instrumentalising plants in such a way that they lose their ability to reproduce and to adapt. If this position is taken, that would entail questioning current practices in how plants are handled.



A clear **majority** understands treating plants with restraint to mean not damaging or destroying plants for no rational reason. For a smaller **majority** it also means that we are required to treat plants carefully and considerately and to limit their use and exploitation.

For the **majority**, handling with restraint means that a sound and appropriate justification is necessary if plants are to be instrumentalised so that they lose their ability to reproduce and adapt. A **minority** of the members however does not understand handling with restraint to include this.

A slight **majority** goes even further. For them, «handling with restraint» may also include *absolute* prohibitions, e.g. a prohibition against instrumentalising plants so that they lose their ability to reproduce and adapt. A **minority** does not share this opinion.

2.1.2 Species

Those who take the position that the species should be considered morally for its own sake assume that a species exists in real terms, i.e. that the concept «species» is equivalent to an actual being. A real definition of the species assumes that all members of a species necessarily have particular essential characteristics. This position is supported by the argument that the species is defined biologically: organisms within one species form a reproductive community.

Another position assumes that our concepts of species are nominal definitions. We introduce and use these concepts for a particular purpose. The selected properties we use to name organisms and classify them as a species are empirically observable phenomena, e.g. commonalities in appearance or exclusive reproductive communities, allowing for a degree of variability. However, there are no clearly delimited and unchangeable characteristics, i.e. no essence that necessarily appertains to all organisms of one species. This is concluded from the fact that processes of change in organisms are always gradual. Instead, organisms are classified into a species on the basis of a broad spectrum of properties. If species is understood as a nominal definition, i.e. as an abstract concept of classification, then it cannot count for its own sake. Rejecting a moral consideration of the species for its own sake does not however rule out species protection for other reasons.

A slight **majority** assumes that the species does not count for its own sake, because it has only either instrumental or relational value or because the concept is a nominal definition, i.e. an abstract concept of classification. Abstract concepts of classification cannot be considered as holding inherent worth.

A **minority** is of the opinion that the way we talk about a species is a real definition, i.e. it assumes that the species actually exists and has a real essence, and it therefore counts morally for its own sake.

2.1.3 Individual

The moral consideration of individual plants assumes, among other things, that we know what the individual entity of plants consists of. This question will be left open for the moment. It will be addressed later in the fifth step of the decision tree (see 2.3). First we have to clarify which ethical positions justify the moral consideration of *individual organisms* for their own sake. Then, we shall investigate which of these positions are open to a moral consideration of *plants.*

To solve the issue of whether organisms ought to be morally considered for their own sake, the ethical positions must be examined in terms of two questions: who is the moral object? And, can an individual being itself be harmed?

Possible answers to the question of the nature of the moral object:[3]

- **Theocentrism:** The basis for this position is the idea of a God who is creator, and therefore the creative ground of all living organisms. What counts for its own sake is God. All organisms count because of their relationship to God.
- **Ratiocentrism:** In this position the issue of whether beings count for their own sake depends on their (potential) capacity for reason and their capacity for abstract speech.
- **Pathocentrism:** This position is based on the sentience of living organisms. They count morally for their own sake if they are sentient and are therefore able to experience something, in some way, as good or bad.
- **Biocentrism:** Living organisms should be considered morally for their own sake because they are alive.

3 The position of anthropocentrism has been omitted from this list. Anthropocentrism places the human being in the centre: humans count for their own sake, and it is they who assign value to non-human organisms. The term «human», however, assumes either a theological understanding of humans; or it rests on an attribution of characteristics, such as the capacity to reason. Thus, behind an anthropocentric position there is actually a theocentric one, which derives all values from God, or a ratiocentric one, which makes moral consideration expressly dependent on a specific property that not all humans (as members of the species Homo sapiens) have (not even potentially), and that several non-human organisms can or could demonstrate.

No member takes the theocentric position. The ratiocentric and pathocentric positions are each taken by a small **minority**. A clear **majority** takes a biocentric position.

These centrisms answer the question of which beings count morally for their own sake. The positions are mutually exclusive. Within each of these positions it is nevertheless still possible to consider organisms morally not for their own sake, but for other reasons.

Answers to the question of whether and to what extent a being itself can be harmed:

- **Sentientism:** Only if a being consciously experiences something as harm is it being harmed.
- **Non-sentientism**: Even if an organism is not able to experience anything consciously, it can be harmed. An intervention may be harmful even if it is not experienced as such.

A clear **majority** takes the position of non-sentientism. A **minority** takes a sentientist position.

The position of theocentrism requires a specific belief in God. Furthermore, only God counts for God's own sake, but not the organisms that God created. In terms of ratiocentrism there is unanimity that plants do not have the required capacity for reason that entails we must consider them for their own sake. The positions of patho- and biocentrism, as well as the positions of sentientism and non-sentientism, remain open to the possibility of morally considering plants for their own sake. Someone who takes a ratiocentrist position may be either a sentientist or a non-sentientist. Pathocentrists can only be sentientists. A theocentrist position is compatible with both a sentientist and a non-sentientist position.

2.2 Possible positions for a moral consideration of plants for their own sake

Decision tree step II

2.2.1 Pathocentrism: plants count because they are able to experience something in some way as good or bad, and therefore have their own interests

If a pathocentrist position is represented, the question of whether a plant can be benefited or harmed is linked to the question of whether a plant has some form of internal experience. It must be able to experience a harm or a benefit as good or bad. The condition for an independent positive or negative experience is sentience. An organism which satisfies this prerequisite has its own interests. An act which can be experienced by the organism as harm is therefore morally relevant. If, however, it is unable to experience a harm as negative, such an act is of no moral significance.

There are different answers to the question of whether plants are sentient:

a Plants are not sentient. If a plant has no interest of its own in not being harmed or destroyed, there is no sense in referring to plants as moral objects.
b Plants are sentient. They are therefore part of the moral community.
c We do not know if plants are sentient. It could be that plants have the prerequisites for an internal experience. But it could also be that they only react to environmental stimuli, without being able to perceive them as positive or negative. In such a situation of not-knowing we can either speculate, or investigate whether there are scientific findings that give an indication of sentience.

Not quite half of the members are doubtful, based on current knowledge, that plants are sentient. Conversely, **a small group** considers it probable that plants are sentient. **A group of equal size** considers this question unanswerable on the basis of current knowledge, while **the smallest minority** in the committee considers this question as fundamentally unanswerable.

Note to c. We do not know if plants have sentience

Decision tree step III

For animals, we are in possession of clear indications that they are sentient. For vertebrates, decapods and cephalopods there is even a socially broadly supported agreement that they are sentient. This has been embedded in the Animal Protection Act. These animals are protected from pain, suffering, fear and stress, and interventions that cause such kinds of harm to the animal require justification. For plants, on the other hand, we lack comparable evidence that would indicate some kind of inner experience. For us (and, we believe, for the animals that the Animal Protection Act protects) the internal experience is linked to a kind of consciousness. For plants, we do not have any evidence that they possess such a consciousness.

But it could be that plants nevertheless fulfil the necessary conditions for a kind of sentience. Although plants do not have a central nervous system, the question arises of whether sentience necessarily depends on a central nervous system, and whether disturbances have to be perceived consciously. Since we do not have the kind of access to plants that would enable us to answer this, we simply do not know. It is nevertheless imaginable that plants have other possibilities for experiencing harm or benefit. Studies in cell biology show that plants and animals, which share a developmental history lasting 3 billion years, have many processes and reactions that do not differ fundamentally at the cellular level. Plants can choose between various ways of behaving and can change their behaviour. For example, plants undergo complex interactions with their environment, just as animals do. While animals move and respond to external stimuli e.g. with flight or fight, plants react by modifying their developmental processes and adapting their growth. They thus express great plasticity of behaviour. Plants also have a differentiated hormonal system for internal communication. The action potential of cellular communication also shows similarities to the signals of nerve fibres in animals. Plants react to touch and stress, or defend themselves against predators and pathogens, in highly differentiated ways.[4]

Based on the results of such investigations, we may ask whether the moral consideration of plants can be discarded with the argument that plants lack the conditions of negative or positive experience. It is not clear that plants have sentience, but neither is it clear that this is not the case. It cannot therefore be argued that the reasons for excluding plants from the circle of beings that must be morally considered, have been eliminated.

4 Jürg Stöcklin, Die Pflanze. Moderne Konzepte der Biologie, Bern, 2007.

Is it morally relevant that we do not know whether plants are sentient?

Decision tree step IV

Where we do not know whether plants are sentient, we must decide what consequences this has. If it is morally irrelevant that we do not know, plants can be excluded from the moral community. If, on the other hand, it is morally relevant, the consideration of plants for their own sake is not excluded.

In this situation of not-knowing, the following positions are possible:

a Based on the evidence we consider it probable that plants are sentient, and they must therefore be given moral consideration.
b We do not rule out the possibility that plants are sentient. The fact that this cannot be ruled out is morally relevant.
c We assume that the potential for sentience is present in plants – unlike e.g. stones – in terms of the transmission and processing of information. The presence of the necessary conditions for sentience is considered to be morally relevant.
d We rule out the possibility of plants being sentient, as there are no good grounds for assuming that they are.

Position a goes furthest in terms of moral consideration. It places positive arguments for sentience onto the scales. Position c excludes entities such as stones because it sees no good reason for postulating these entities are sentient. To assume this would, in the view of Position c, be too speculative. Position d categorically rules out the possibility of plants having some kind of sentience.

The **majority** of the committee members at least do not rule out the possibility that plants are sentient, and that this is morally relevant. A **minority** of these members considers it probable that plants are sentient. Another **minority** assumes that the necessary conditions for the possibility of sentience are present in plants. The presence of these necessary conditions for sentience is considered to be morally relevant.

Finally, a **minority** of the members excludes the possibility of plants having sentience, because in their view there are no good grounds for such an assumption.

2.2.2 Plants count, because they have a good of their own and therefore something can be «in their interest», or because they are alive

Decision tree step III

Even if plants do not have their own interests, it is still possible to say that something is in their interest. The precondition for this is that they have a good of their own. Organisms that have a good of their own may have good and bad things done to them. If plants do have a good of their own and something can be in their interest, then they must be given moral consideration. A plant can also be harmed even if this harm is not effected through the sentience of the plant and if it cannot express this directly.

If we assume that plants have their own purpose, as it were, a *telos,* then it follows that damaging their ability to adapt and reproduce beyond a certain extent would require justification, since the plants would then no longer be in a position to realise this *telos*. Plants strive for something, e.g. to develop, to reproduce, to flourish *(Gedeihen)*.[5] They attempt, in their own way, to maintain or even increase their own good. For example, the species-specific development of a plant could be described as its own good. This concept is coupled to a realist position, which ascribes specific essential characteristics to species.[6] Some find that the disproportionate instrumentalisation of plants goes beyond limiting this *telos*. It is not only about taking plants' «goals» away from them, but about their complete instrumentalisation, which changes the relationship between humans and organisms in a morally impermissible ways.

Decision tree step IV

If we assume that plants have a good of their own, the question of whether we need justification to harm or destroy plants has the following possible answers:

- It is morally neutral to harm or destroy a plant's own good.
- It is morally bad to harm or destroy a plant's own good.
- We do not know if it is morally bad or neutral to harm or destroy a plant's own good.
  - Not knowing this is morally irrelevant.
  - Not knowing this is morally relevant.

The **majority** opinion is that we require justification to disturb plants' *ability to develop*.

A somewhat smaller **majority** also takes the position that we require justification to disturb plants' *lives*.

5 On the term Gedeihen (flourishing) see also Angela Kallhoff, Prinzipien der Pflanzenethik. Die Bewertung pflanzlichen Lebens in Biologie and Philosophie, 2002.

6 This concerns a key issue of engagement between the positions of realism and nominalism. On this, see also Section 2.1.2.

2.3 What has a good of its own, or its own interests?

Decision tree step V

So far we have left open the question of what unit of plant may have a good of its own, or in the case of sentience has its own interests. The following answers are possible:

- An independent survival-competent plant component: In contrast to animals, where the individual cells and organs cannot exist on their own, some individual components of plants can survive independently.
- Individual plant
- Plant network (populations)
- We do not know.
  - This question can be answered in principle.
  - This question can be answered only case by case.
  - This question must be left open.

Plants are not constructed centrally, but in components. We must therefore examine whether individual, independent survival-competent plant components could be the object of moral consideration. It remains uncontested that plants do have an overall coordination of their individual components. Investigation of the root growth of two cloned plants growing next to one another allows us to conclude that plants are able to differentiate between themselves and an Other. We could therefore conclude that the option of plant components as objects of moral consideration is excluded.

No member takes the position that the individual plant component counts for its own sake.

The **majority** of the members assumes that the object of moral consideration is the individual plant.

A smaller **majority** also takes the position that plant networks are the object of moral consideration.

A small **minority** considers the question of the object of moral consideration to be answerable only on a case by case basis.

2.4 What weight do the interests of plants have in comparison with the same interests of other organisms?

How much do the interests of the objects of moral consideration count? Here there are fundamentally two possible answers:

- The egalitarian position takes the principle that for all living organisms, like should be evaluated and treated as like and unlike should be evaluated and treated as unlike. It concedes the possibility that plants genuinely could have the same interests as other organisms, and that these should then be treated equally.
- According to the hierarchical position, all living organisms deserve moral respect, but not for all organisms equally. Either what counts is the species to which it belongs and human interests are weighted more than the same interests of plants (or animals), or it is the complexity of properties. The more similar the properties are in terms of their complexity to those of humans, the higher their moral significance.

The hierarchical position can be criticised for being unclear about why the membership of a species, or the complexity of abilities, should be morally relevant. This objection is usually countered by saying that the complexity of an organism's *telos* correlates with its ability to perceive harm. Further, we should take into account that our understanding is multiply situated, i.e. it remains tied to the abilities given to us and achieved by us culturally: the human perspective cannot be overcome. This does not rule out our ascribing moral status to other living organisms.

Concerning the handling of *individual plants,* the **majority** takes the position that we need less strong reasons to justify their use than it is required to use (vertebrate) animals (animals as defined by the Animal Protection Act). A **minority** is of the opinion that such hierarchisation can only be decided on a case-by-case basis.

Concerning the handling of *plant species,* a slight **majority** agrees that endangering a plant species is equally significant as the same endangerment of a (vertebrate) animal species. The larger **minority** takes the position that these two endangerments should not be valued equally but hierarchically. A small **minority** considers this question to be unanswerable.

3 Conclusions on handling plants

As the preceding discussion has shown, the ECNH members do not adopt uniform fundamental ethical positions, and consequently in the individual questions there are generally no unanimous opinions. Nevertheless, some unanimous or majority conclusions for the treatment of plants can be derived:

1. Arbitrariness:
   The Committee members **unanimously** consider an arbitrary harm caused to plants to be morally impermissible. This kind of treatment would include, e.g. decapitation of wild flowers at the roadside without rational reason.

2. Instrumentalisation:
   For the **majority** the complete instrumentalisation of plants – as a collective, as a species, or as individuals – requires moral justification.

3. Ownership of plants:
   For the **majority** here too, plants – as a collective, as a species, or as individuals – are excluded for moral reasons from absolute ownership. By this interpretation no one may handle plants entirely according to his/her own desires. A **minority** concludes that no limits apply to handling plants insofar as they are property.

4. Genetic modification:
   According to the **majority** position, there is nothing to contradict the idea of dignity of living beings in the genetic modification of plants, as long as their independence, i.e. reproductive ability and adaptive ability are ensured. Social-ethical limits on the genetic modification of plants may exist, but are not the object of this discussion.

5. Patenting:
   For the **majority** the ethical justification of patenting plants is a question of social ethics. It is not one involving the consideration of plants *for their own sake* and therefore not the object of this discussion either. For a **minority** the patenting of plants as such is morally impermissible and contradicts the dignity of living beings with regard to plants.

6. Diversity:
   Genetic modification of plants should, in the **majority** opinion, always involve consideration of conserving and safeguarding the natural, i.e. not man-made, network of relationships.

7. Proportionality:
   A **majority** considers any action with or towards plants that serves the self-preservation of humans to be morally justified, as long as it is appropriate and follows the principle of precaution.

Relationship between conclusion 1 and 3

Conclusion 3 expresses the different moral stances according to which it is unanimously held that plants may not be arbitrarily destroyed, in accordance with Conclusion 1. As 3 shows, the majority considers this morally impermissible because something bad is being done *to the plant itself* without rational reason and thus without justification. A minority considers this treatment to be impermissible as well, but for another reason: because this destructive treatment of a wild flower expresses a *morally reprehensible stance*.

Social-ethical limits

Social ethics is not primarily concerned with individual human actions, but with the social structures and institutions that permit and encourage possible individual actions and prevent or limit others. However, social structures do not exist for their own sake, and should be examined continuously in terms of how they affect the interplay of the various actors and what impacts this has on the actions of individuals and communities. The application of gene technology in agriculture, for example, is one such social structure that affects farmers' room for manoeuvre. If the application of gene technology in plants leads to injustice within a community, social-ethical limits on the applicability of this technology might be appropriate.

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